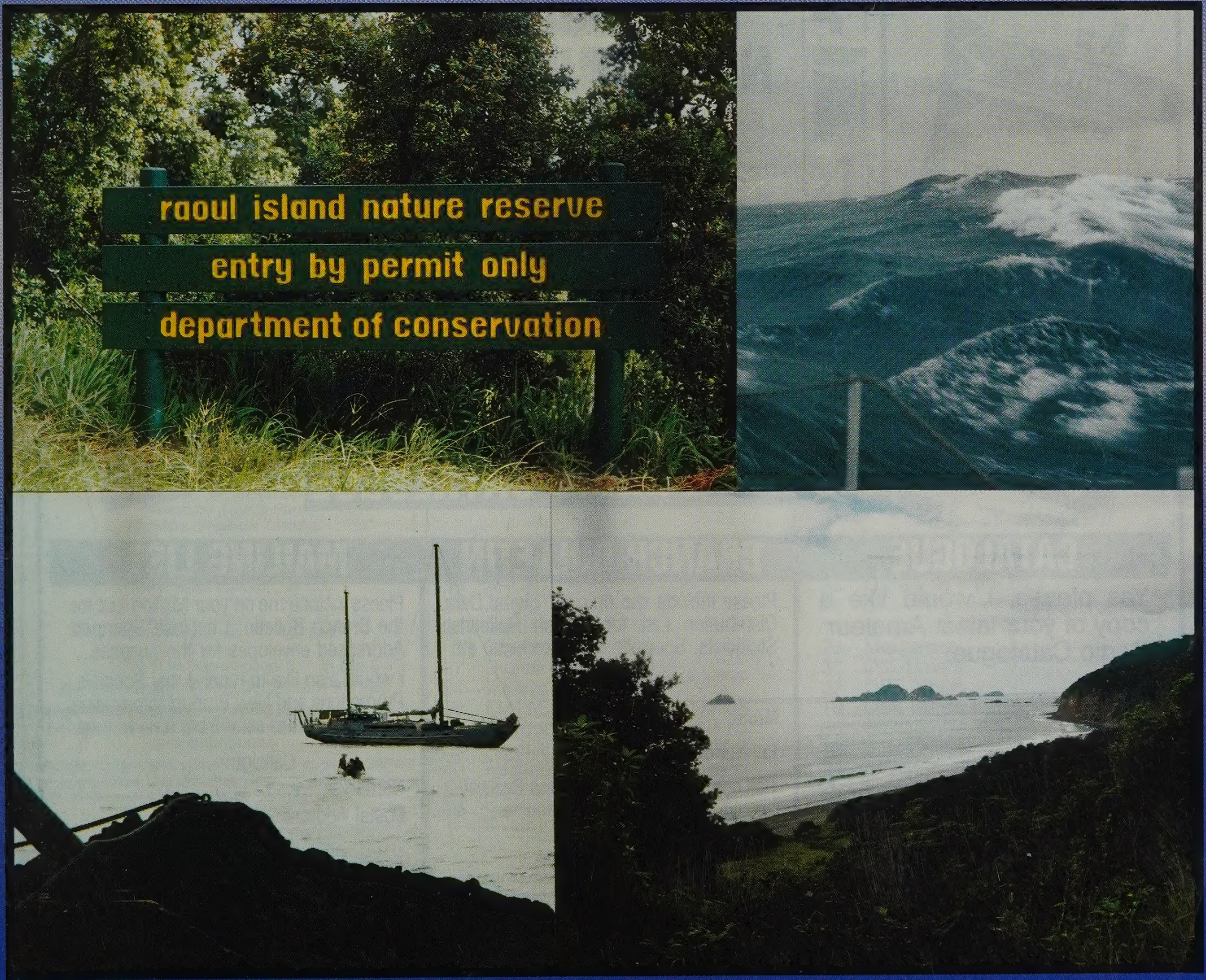
BREAK-IN

The Official Journal of the New Zealand Association of Radio Transmitters (Inc.)

Dedicated to **Amateur Radio** in New Zealand since 1928

July 1996



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The term break-in refers to a system in CW whereby the transmitting station can hear the other station's signal during "key up" periods.

BREAK-IN

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The ZL8RI trip to Raoul Island. Left to right—the welcome, the 15 ft seas, the yacht *Evohe*, looking out to Meyer Island and Napier Island.

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FROM THE PRESIDENT

JIM MEACHEN
ZL2BHF

HELLO EVERYONE. Yes, Capital Conference 96 has been and gone. Thank you Wellington for a great weekend, wow! The weather was cold but the hospitality so warm. The weekend provided that great annual opportunity to meet members from so many Association Branches.

The activities of Council and the Annual Meeting are well covered elsewhere in this issue but I would like to take the opportunity to mention some of the special awards I presented at Conference.

It was my pleasure early on the Saturday morning to advise Ron Kingston QSM ZL4MK by telephone from the Conference floor that Conference had awarded him Honorary Life Membership of our Association.

Ron was awarded the QSM in 1992 for his involvement with AREC in both Otago and Southland since 1974 and involvement in Search and Rescue and Civil Defence. He was honoured by NZ Land Search and Rescue in March this year when the Chairperson for New Zealand Land SAR presented him with the NZ Land SAR Award as a mark of respect for his more than 40 years involvement with Search and Rescue. At the same function Ron was further recognized by the New Zealand Police with a Certificate of Appreciation for over 40 years outstanding service to SAR in the Dunedin and Otago Police Districts. Congratulations Ron QSM ZL4MK from us all.

To Saturday night and it was time to make Amateur of the Year Award for 1995. The winner, known to many affectionately as "The Keeper of the Keys to Taranaki", was Peter Cramer QSM ZL2AIS. What a pleasure to make such an award.

Branch 27 said Peter was the epitome of the amateurs' code and a most worthy nominee for the Amateur of the Year Award on a back to basics approach; not only for his outstanding service during 1995, but indeed for many years.

Peter is a keen supporter of NZART and a life member of New Plymouth Branch 27. He was the one chosen to officially open NZART's 1994 Conference in New Plymouth, even though the Official Party included District, National and International identities—such is the respect with which this year's winner is regarded in Taranaki. Congratulations Peter.

The final award on the Saturday evening was the NZART Youth Achievement Award this year with two recipients.

The first of the first-equal winners of the Youth Achievement Award for Best Examination Result was Lynley Simpson ZL2ULM who was 13 years of age at the time of this year's March examination. Lynly comes from Murchison, about 130 km south-west of Nelson. Her father is Ken ZL2TBE, her mother is Nancy ZL2TBI.

The second first-equal winner of the Youth Achievement Award for Best Examination Result was Jun Kendrick from Vogeltown in New Plymouth who was 15 years old at the time of the September 1995 examination. Jun attended the amateur radio classes conducted by Trace ZL2BS for Branch 27. His father, his mother and his brother have also passed the amateur examination and are all currently plugging away at their CW.

Both winners will receive a specially endorsed framed certificate, a $100 voucher for books of their choice from the NZART Publications Department and a year's free subscription to NZART.

Great results from great people. I again congratulate the recipients and thank all Branches for their nominations.

Alan Wallace ZL1AMW, Association Vice-President, will present this column for the next two months while I am on work assignment in Atlanta.

Until next time,

73 Jim Meachen ZL2BHF
President

COUNCIL COMMENTS

NZART Council met in Wellington on Monday, June 3, 1996. The President had provided a resumé at the AGM of Council business transacted on the previous day. You can find these items in the AGM précis minutes elsewhere in this issue. Items discussed covered those arising from the Saturday AGM—there were no held over items from the Friday Council meeting.

All cups and trophies previously held at Headquarters have been handed over to John Litten ZL1AAS, Contests Manager, for updating and display. More details from John in his *Break-In* column.

A grant has been made to the AMSAT Phase-3D control team to assist with expenses.

Newly appointed OC AREC Brian Purdie ZL2TPS reported to Council on a review process developed over the weekend. He made recommendations to Council for the appointment of Deputies and Area Officers. The review encompassed titles of appointed AREC Officers, AREC call-sign prefixes/suffixes, a suggested name change to "Amateur Radio Emergency Communications", this is to be examined by Council, a new type AREC Manual in ring-binder form, AREC ID cards, a new look at AREC Field Day format, the Section Leaders' net frequencies.

Councillor Steve Davis ZL2UCX displayed NZART World Wide Web pages and format to the meeting, and Councillor Vaughan Henderson ZL1TGC showed video tape portions of the 1996 Dayton Hamvention. It is hoped to have this tape added to the NZART Video Tape Library section in due course.

An update on the International Beacon Project (IBP)

Compiled from information supplied by the IBP co-ordinator, John Troster W6ISQ and Jamie Pye ZL2NN. Regional co-ordinators are Martin Harrison G3USF for Region I, Joel Harrison WB5IGF for Region II, and Jamie Pye ZL2NN for Region III.

Five-band beacons have been delivered to W6WX, YV5B, LU4AA and JA2IGY. Tested and packed for despatch are beacons for ZS6DN and 4X6TU. Ready soon are beacons for 4U1UN and KH6WO.

N6EK who designed the beacons and builds them has started on the final batch. These are destined for CT3B and OH2B followed by ZL, VK, 4S7 and 5Z4. Negotiations are going on with Peru, Canada and China to complete the planned basic network of 17 beacons. A further six "infill" beacons are planned. Consideration is also being given to establishing a network of 6 m beacons.

When the system is fully operational the beacons will operate on 14.1, 18.110, 21.150, 24.930 and 28.2 MHz. At present LU4AA (Argentina) and YV5B (Venezuela) are operational on all five bands and W6WX/B (California) is operational on 14.1, 21.5 and 28.2 MHz. Other beacons to be found on 14.1 MHz are 4U1UN/B (New York), JA2IGY (Japan), ZS6DN/B (South Africa), 4X6TU (Israel), OH2B (Finland) and CT3B (Madeira). The time schedule in use is: 00:00:00 4U1UN, 00:00:20 W6WX/B, 00:01:00 JA2IGY, 00:01:40 ZS6DN/N, 00:02:00 4X6TU, 00:02:10 OH2B, 00:02:20 CT3B, 00:02:30 LU4AA/B.

Why not listen out for them and put in a reception report to the nearest DX Cluster to help the DX hounds?

ZL1HV

FROM THE EDITOR

JOHN R. L. WALKER
ZL3IB

ONE of the less arduous duties is to attend the Annual NZART Conference although I must confess that a rather bumpy flight from Christchurch to Wellington was not much fun. However, the Conference itself was a very enjoyable event and the friendly welcome from so many new and old friends more than compensated for the inclement weather. It was especially pleasing to be able to meet up with the writers of many of our regular columns and I'd like to take this opportunity to express the editorial team's thanks for their sustained efforts.

Conference proceedings more or less followed the traditional pattern but thankfully there was only one remit so not too much time was spent in protracted discussion. A highlight of the AGM was the award of Honorary Life Membership to Ron Kingston ZL4MK. During the rest of Conference there was a choice of various forums and group meetings to attend. Of popular interest were the talks and video presentations on the recent ZL8RI DXpedition to Raoul Island and the Kiwi Contest Group ZM2K. Both the Saturday and Sunday evening social gatherings were convivial occasions much enjoyed by delegates and their partners. Finally, a big "thank you" to the hard-working organizers.

Ham shack photos, etc

From time to time we have space at the end of articles and I should be grateful to receive photos of local hams in their shacks, interesting mobile or antenna installations, etc., to fill these spaces. Photographs may be black and white or colour but should have bright colours and high contrast; a good guide is to see how they photocopy. Please include a short descriptive caption so that our readers know what it's all about.

Translators wanted

Break-In receives exchange copies of ham radio magazines from several overseas countries and many of these include interesting technical articles which I should like to reprint in *Break-In*, usually as part of "Technical Forum" or as complete articles. To this end I would be grateful to know of anyone who feels they could help in this way by making technical translations from German, Dutch, Italian, Czech, Danish, Norwegian or Finnish. I think it only fair to say that some familiarity with technical terms in both English and the foreign language would be essential.

MINUTES OF CONFERENCE 1996

1. Welcome

A sudden change to a cold blustery rainy southerly introduced the 190 registered delegates to the start of the Wellington Conference. Ron Wills ZL2TT, President Branch 50, welcomed the assembly to the Capital.

2. Official Opening

Doug McNeill ZL2AOV, Conference Committee Chairman, declared the Conference officially opened and detailed minor amendments to the weekend programme.

3. Silent Keys

Delegates stood as a mark of respect to Silent Keys.

4. Apologies

Apologies were sustained for ZL1AOX, ZL1TRE, ZL1BIG, ZL1CH, ZL2GL, ZL3QR, ZL3TCR and ZL1AC.

5. Substitute Delegates

Proxy votes were uplifted by delegates for the following Branches: 53 (ZL2VQ), 03 (ZL1BNE), 35 (ZL2ADK), and 33 (ZL1TGC).

6. Roll Call

A roll call was taken and it determined that 2,457 transmitting members were present representing 82.53 per cent of the eligible votes. President ZL2BHF then declared Conference was in session.

7. Voting Procedure

The President explained the voting procedure and that this would be called firstly on voices, secondly on show of hands and thirdly on a poll if either of the foregoing appeared indefinite.

8. Council Matters

ZL2BHF reported on Council business transacted the previous day.

Reports

The reports of all Officers were received.

Appointments

Council made appointments to Officer positions and working groups. Retiring OC AREC Don Mackay ZL3RW was thanked for his contribution. The new appointee to the position of OC AREC is Brian Purdie ZL2TPS. ARDF Co-ordinator Max Wheatley has relinquished his role and a replacement will be advised at a later date. Steve Davis ZL2UCX appointed to a new position of NZART Page Editor World Wide Web.

1997 Subscriptions

The subscription remains the same as the 1996 rate with a rebate scheme applying to most subscription categories paid by October 31, 1996. Some adjustments have been made to rebates. They are $7.50 on the Full $65.00 fee, $20.55 per Family member with a maximum of $85.00 and the Junior subscription of $45.00 will attract a $5.00 rebate. As previously there are no rebates on Concessionary or Student rates.

Ministry of Commerce representation

Mr Wayne Wedderspoon, Manager Spectrum Policy from the Ministry of Commerce was welcomed to the Council meeting. A range of issues currently in progress with the MoC were discussed. These included the release of call-sign database information, the Association's examination format proposal, handicapped operator concessions, Differential GPS services in the 1.8 MHz band, issues concerning the 614 to 620 MHz band and testing parameters for the Morse code examination.

History of the Association

Ron Parry ZL3VX reported on the progress of our book working-titled "Ham Shacks, Brass Pounders and Rag Chewers, 75 Years of Amateur Radio in New Zealand" by our historian Ian Dougherty. Ian was at the meeting today and was available to talk to members about the project and perhaps uncover more material.

Application for Affiliation

Council has granted affiliation status to the Canterbury Amateur Radio Development Society (CARDS). This group, based in Christchurch, has been formed to promote and develop amateur radio as an educational tool, emphasizing youth involvement.

NZART visit to WIA

A report from the two NZART representatives Carol Gaudin ZL2VQ and Jim Meachen ZL2BHF to the Wireless Institute of Australia's 60th National Convention held in Melbourne May 18–19, 1996, was tabled. The agenda followed a standard format on the Saturday and Sunday with annual reports, remits, etc., with a guest speaker from the Spectrum Management Agency, the Australian version of the Ministry of Commerce. The main thrust of this address involved self-policing in the Amateur Service and other related issues.

A "Strategic Plan for the Future" was a forum topic on the Sunday. There were many common interest subjects and views were exchanged on items of topical interest. The NZART World Wide Web page was displayed including the Future of the Amateur Service entries which drew some favourable comments.

Report of the IARU Liaison Officer

Terry ZL3QL reported on his recent visit to Tokyo where he had discussions with the Japan Amateur Radio League. He gave an overview of current international amateur radio issues including background on the IARU Future of the Amateur Service Committee (FASC), of which he is a member. The current discussion paper and other documents circulated to NZART Branches is already generating some submissions. Council gave support for the attendance of ZL3QL at the IARU Region I Conference at Tel Aviv in September this year. Considerable interest in the New Zealand position on various WRC issues has been shown by other overseas IARU societies.

9. Minutes

The full text of the 1995 Annual General Meeting minutes was tabled. These appeared in *Break-In* July 1995, pages 3–7 in abridged form. The minutes were adopted.
ZL1HV/ZL1TAF

10. Annual Accounts

The accounts for the year ended December 31, 1995, were published in *Break-In* April 1996, pages 20–23. The Treasurer explained items raised by delegates. The accounts were taken as read and adopted after discussion.
Allan Cross/ZL1HV

11. Appointment of Auditor for the Association

The Treasurer recommended to the meeting that Parsons Roddick and Company, Upper Hutt, should continue as the Association Auditors. This was adopted.
Allan Cross/ZL1BQA

12. President's Report

The President's report was published in *Break-In* April 1996, page 14. The report was adopted.
ZL2BHF/ZL4KJ

13. General Secretary's Report

The General Secretary's report was published in *Break-In* April 1996, page 15. The report was adopted.
ZL2AKV/ZL1TGC

14. Treasurer's Report

The Treasurer's report was published in *Break-In* April 1996, pages 15–16. The report was adopted.
Allan Cross/ZL1PAM

15. IARU Liaison Report

The IARU Liaison Officer's report was published in *Break-In* May 1996, page 10. The report was adopted.
ZL3QL/ZL1IC

16. AREC Report

The report of the OC AREC was published in *Break-In* April 1996, page 16. The report was adopted.
ZL3RW/ZL1BNE

17. Contests Report

The Contests Manager's report was published in *Break-In* April 1996, page 11. The report was adopted.
ZL1AAS/ZL1HV

Awards Manager's Report

The report of the Awards Manager was published in *Break-In* May 1996, page 11. The report was adopted.
ZL1AAS/ZL1HV

19. *Break-In* Editor's Report

The report of the *Break-In* Editor was published in *Break-In* April 1996, page 17. The report was adopted.
ZL3IB/ZL2SX

20. Administration Liaison Report

The Administration Liaison Officer's report was published in *Break-In* April 1996, page 18. The report was adopted.
ZL2AMJ/ZL2UCX

21. FMTAG Report

The report of the Chairman, Frequency management Technical Advisory Group was published in *Break-In* April 1996, page 18. The report was adopted.
ZL2IP/ZL1TGC

22. Official Broadcast Report

The report of the manager, Official Broadcast was published in *Break-In* April 1996, pages 18–19. The report was adopted.
ZL2BHF/ZL2KH

23. QSL Bureau Report

The report of the Manager, QSL Bureau was published in *Break-In* April 1996, page 19. The report was adopted.
ZL2RR/ZL4JG

24. New Zealand Monitoring Service Report

The report of the Co-ordinator, New Zealand Monitoring Service was published in *Break-In* May 1996, page 11. The report was adopted.
ZL2SX/ZL1DDL

25. RF Radiation Report

The report of the Co-ordinator, New Zealand Radiation Standards was published in *Break-In* April 1996, page 19. The report was adopted.
ZL2BBJ/ZL2AMI

26. NZART Stolen Equipment Register Report

The report of the Manager NZART Stolen Equipment Register was published in *Break-In* April 1996, page 20. The report was adopted.
ZL2KH/ZL2ADK

27. EMC Co-ordinator Report

The report of the EMC Co-ordinator was published in *Break-In* May 1996, page 11. The report was adopted.
ZL2CA/ZL1AIZ

28. Remits

ZL2OI introduced the Branch 16 remit. ZL3VP, Branch 05 supported the remit and instanced when he was a non-transmitting member some 40 years ago and pleased to see his entry—now the Privacy Act has to be considered. ZL1BQW, Branch 67, said her Branch supported the remit. ZL2SX, Branch 74, commented likewise, some acknowledgement that non-transmitting people are members of the Association. ZL2KH, representing Branch 54, thought the Call Book was for amateurs' call-signs. The remit was put and was CARRIED on voices.

ZL1TGC, proxy for Branch 33, and Councillor said that from the few remits this year it could be construed that members were happy with the way things were going, that we are doing an excellent job, or that everyone is just fed up. There must be other issues that can't be resolved by Council—some issues can be best done by remit action—we need more feedback and hopes that next year will see more remits on the order paper.

ZL2BHF briefly outlined an outstanding achievement in longevity—Roger Claridge ZL1RH will turn 100 years in a few days time. Next Saturday the Taupo Club will set up a station between 2 pm to 3 pm and delegates and friends were requested to give Roger a call that day.

ZL2BHF continued, Council had recommended to the AGM that Ron Kingston ZL4MX be made an honorary Life Member of the Association for his more than 40 years outstanding contributions to the AREC scene. Tributes from organizations that Ron has been involved with have been bestowed by the Police, Civil Defence, Land SAR and Branch 30. The recommendation was carried by acclamation and applause from the delegates. A telephone call relayed through the speaker system was made to Ron to advise him of the honour. Ron Kingston ZL4MK suitably replied and thanked delegates for granting him this honour.

Continued on next page

Wireless Institute of Australia—60th National Convention

TAKING advantage of special airline prices meant an early departure from Auckland International Airport (and an even earlier check-in time!). NZART President Jim ZL2BHF and myself were to represent NZART as guests at the 60th National Convention and Annual General Meeting of The Wireless Institute of Australia in Melbourne, during the weekend of May 18–19, 1996. We were accompanied on the trip by my OM Wayne ZL2VN, who was to spend the weekend as a guest of my ALARA sponsor, Muriel May and her OM Neil VK3KNM.

After an uneventful flight and a smooth passage through Customs and Immigration services, we were met and welcomed at Melbourne Airport by Donna Reilly, WIA Federal Office Manager, and my ALARA sponsor and her husband. As it was still early in the day of Friday, May 17, and as Donna still had a full day's work ahead of her, we proceeded to the venue for the weekend to find the rooms were not yet available for use. Hence began a whirlwind trip around the streets of Melbourne, which included a stop at "have to visit it today because it won't be open Monday" retail factory outlet. Following lunch at a sidewalk café on Lygon Street, Jim and I returned to the meeting venue to unload the bags and prepare to meet our hosts for dinner.

This exercise wasn't as simple as one would expect. There were no familiar faces amongst the gathering hotel guests; no obvious signs of anything Amateur Radio-related like name badges or handheld transceivers; and numerous enquiries at the Reception Desk and calls to rooms we knew to be WIA-occupied proved fruitless for a number of hours. It was about this time that we realized that many of those attending the Convention had to travel further than we had! We were eventually met and greeted by WIA President Neil Penfold VK6NE, who introduced us to Federal Secretary Peter McNaish VK2BPN, before proceeding to a much needed evening meal. It had been a long day and the Convention hadn't started yet.

The Convention and AGM began at 0830 Saturday. Jim and I were officially welcomed and introduced to the members attending, and provided with documentation to enable us to follow the proceedings. Unlike NZART's AGM, the number attending this meeting consisted of the WIA Federal Executive (President, Company Secretary, Office Manager, and two Directors), one Federal Councillor representing each of the seven VK Divisions (or states) and in most cases their Alternate (or deputy), the IARU representatives, Jim and myself from ZL, a total of about 20 people. We were joined for a short time on Saturday afternoon by the Editor of *Amateur Radio Magazine*.

This was to be one of the only differences I personally noticed between the two organizations. As the Agenda was followed in standard format throughout Saturday and Sunday, with Annual Reports, Recommendations (Remits), re-appointment of Co-ordinators (Officers), setting of Federal Content of the Annual WIA subscription, etc., the topics, the issues, and even "the personalities" became all too familiar.

Saturday evening's Official Dinner Guest Speaker was Mr Peter Young from the Spectrum Management Agency, our equivalent of the Ministry of Commerce. The main thrust of his address related to the self-policing attitude of the Amateur fraternity to interference and EMC-related issues. These proved to be rather controversial issues amongst some of those in attendance and, needless to say, the following "question time" put a bit of pressure on the speaker, which he handled very well. Yes, the Morse code issue was raised! We should be grateful in ZL for the excellent liaison we have with our MoC at National level. We were also advised of the availability of a Special Traveller's Short Term Reciprocal Licence—briefly two months for A$24. (I'll find and advise further details later!)

The Agenda continued on Sunday and concluded with a Forum entitled "The Strategic Plan for the Future". All in attendance found this to be a very interesting Forum, and it's a pity time was limited. It is something that we should be looking at, *and soon!*

The Convention concluded with the exchange of small souvenir gifts (we had previously distributed back issues of *Break-In*, lapel pins and the odd Call Book, which were very enthusiastically received), and we were provided with the opportunity for comments on the weekend's activities. As we had been able to contribute to the Convention by relating the ZL experience on a number of occasions, this bi-ennial exchange of representatives proved to be a very worthwhile exercise for both organizations. Names and call-signs had become familiar faces as we thanked our hosts for the hospitality, most of whom then promptly departed for their respective QTHs. I still haven't figured out the relationship between the Members, the Divisions, and the Federal Institute!

As Jim had to return the next day, he continued to be hosted by WIA. I departed the venue to join my OM as a guest of my ALARA sponsor and her family. To obtain the best advantage of the special airline prices, we spent the next two and a half days in a whirl of shopping (I had been saving since February, so he can't complain) sightseeing and laughter. The airline slapped a "HEAVY" sticker on one of our bags, made us weigh the cabin luggage, and after an uneventful flight to Auckland and a five hour drive through a wet night, we arrived in New Plymouth at 4.00 am, exhausted, but having survived a huge leap in the learning curve, and ready to pass on that experience to the members of NZART.

I take this opportunity to again thank the Members of WIA Federal for their hospitality, and also to thank the members of NZART for the opportunity to be their representative at this very worthwhile exchange.

Carol Gaudin ZL2VQ
Central Districts Councillor

Continued from previous page

29. Fixing of Venue for the 1997 Conference

ZL1TC said that although Hamilton Branch 12 had indicated earlier they would host the 1998 Conference his members had advised him that they would be willing to advance this request to 1997 and leave 1998 open for some other group.

30 General Business

ZL4HG spoke on Call Book issues. His subcommittee had considered sales of Call Books and that costs had risen in the last year. Coupled with these considerations was the fact that the call-sign updates were not likely to resume in the foreseeable future. We should look at the information we need at a reasonable price—it could be for members only and not for sale—updates could be arranged—this would increase the price initially—the publication would be referred to many times in its lifetime. ZL1DDL considered overseas members should be included as well. ZL4HG continued—the Call Book could be converted to electronic form but it would not be appropriate for the World Wide Web. ZL3IB spoke of cost for loose-leaf—a five year shelf life—a better presentation of the Call Book. ZL4HG said there would be a new format next year. ZL2BHF said cost is an issue—how much repetitive information needs to be published. ZL4HG advertisers are sorely needed to balance costs and to let himself, ZL1HV, ZL2VQ or ZL3VR know. ZL1AIZ favoured the present system. ZL1BQA supported ZL1AIZ and believed a lot of material in the present Call Book is not used—costs could be streamlined. Further general discussion and points of view evolved on the issue. ZL2BHF commented on the lack of Branch Directory information returned to Headquarters.

The meeting adjourned for lunch at 12 pm and resumed at 12.50 pm.

John Litten ZL1AAS and Stan White ZL2AHC conducted a short session about Contests followed by Terry ZL3QL and Jumbo ZL1HV with FASC (Future of the Amateur Service Committee).

The Stirrer's Award was presented to Ulrich ZL1DDL for his vocal contributions to the meeting.

ZL1HV moved a vote of thanks to the Chair which was carried with acclamation.

31. Formal Closing

ZL2BHF declared the Annual General Meeting closed at 2 pm with next year's Conference to be held in Hamilton.

Finding an alternative to the G5RV

by KELVIN PETER BARNSDALE ZL3KB

THE miracle had happened, the full licence had arrived in the post and the world was my oyster. The aerial had to be put up as soon as possible, and I chose to start with a G5RV as what could be better and cheaper than an "all band" bit of wire? Some large quantities of overhead telephone cable, because it must be strong, was procured from the salvage depot and an open wire ladder line feed was constructed using strips of Lexan (polycarbonate) as spacers. The centre of the "dipole" was held up with an 8 m water pipe mast firmly guyed on top of the roof, and the ends of the aerial held off the ground with 5 m stakes. The local library supplied all the aerial books I desired, and all wires were cut to the dimensions as directed. Simple.

Louis Varney G5RV designed his famous aerial back in 1946 when all amateur rigs had relatively bomb-proof output valves which allowed quite a bad aerial impedance match to be tolerated. With the coming of the transistor we have had to improve our impedance matching, and the G5RV design has survived because it seemed to offer the best compromise of simplicity and all-band performance. In July 1984 he updated the design and suggested it needed to be used with an aerial tuner to keep the modern-day rigs happy. It is my impression that the latest Japanese rigs will tolerate less and less reflected power, and my "state-of-the-art appliance" starts to shut down above a VSWR of 1.5:1. Sales of Aerial Tuner Units must be doing very well.

Unlike the design of most all-band aerials, the G5RV was not designed to be a halfwave dipole on its lowest frequency, but instead a one and a halfwave doublet on 14.15 MHz. The total length of the G5RV top is 31.27 m (102') fed in the middle by a 10.36 m (34') open wire ladder line matching section (Figure 1), followed with any length of 75 Ω twin lead or 80 Ω coax. If 300 Ω ribbon twin lead is used in the matching section the length must be shortened to 8.5 m (28') or 9.3 m (30' 7") if the low loss type is used. Ideally the top sections should be horizontal, but making the centre higher than the ends in an inverted V shape lowers the resonant frequency a little, approximately 50 kHz at 14 MHz for 120° between the wires. It is always better to have the high current portion of the aerial, the centre in this case, at the highest point as this is the node of maximum radiation.

The system can be used on top band 1.8 MHz if the two down leads are connected together and used as a top loaded Marconi aerial, but you need a very good earth for this. On 3.5 MHz the aerial looks like a dipole with the middle 9 m folded together, causing the feed impedance to be highly reactive. On 7 MHz the top section appears as two half waves in phase, again presenting a very reactive load. As previously mentioned, the 14 MHz case is a three half wave aerial giving an impedance of 100 Ω at the centre, and the matching section transforms this to 72 Ω. 21 MHz makes the aerial work as two full wave sections in phase, presenting a high impedance again. However, this can perform very well in theory if open wire feeders are used. The remaining band on 28/29 MHz will make the aerial into a couple of three half wave sections in phase and again the tuning section does little to match the coax.

So much for theory. Now to try the beast. Without an aerial tuner (ATU) the VSWR was horrible. Unfortunately the impedance at the bottom end of the matching section is only good on two bands, 20 m and 12 m, while 40 m has the worst results of all. I was using 50 Ω coax too, so that made it worse. A colleague from the UK, G3TCT, was staying with us at the time and he helped me pull it all down again for inspection and serious head scratching. "What is the wire made of?" he asked, and a pair of cutters revealed the core of the solid "copper" wire was coloured silver—steel! Quickly replacing the telephone cable with stranded copper, the aerial was re-erected and tested again. The VSWR was just as bad. I could have accepted this performance and left it up to the ATU to keep the delicate Tx finals happy, but I had seen how bad it was and wanted to improve it.

In the book *Practical Wire Aerials*, Varney's results of the original G5RV are portrayed, and show 80 m, 40 m and 30 m give a reactive load, 20 m and 12 m give a load of 90 Ω resistive, and 17 m, 15 m and 10 m give a high impedance load, adding that an ATU is essential on all bands for safe operation. So much for the ALL BAND aerial! Louis Varney states the best results will be obtained when an open wire ladder line is used between the matching section and the ATU; presumably because it will cause minimum loss with the high standing waves, and has less chance of high voltage breakdown.

Reading on in the same book, an alternative "G5RV" was offered, a modified version designed and named ZS6BKW. He developed a computer program to take the G5RV and determine the optimum dimensions for the matching section and top length, matching the whole into a feed cable of 50 Ω coax commonly used on modern day rigs. The results showed an improvement in VSWR on five bands, but the utopia of an "ATU free" wire aerial was still out of reach. His new design suggested the top lengths should be 27.9 m (91' 6"), shorter than the G5RV which is an advantage, and the matching section should be a 400 Ω open wire ladder with a length of 13.6 m (44' 7") before the velocity factor is applied. He specifies the construction of the matching section explicitly, saying it must be made of 1.2 mm diameter wire, with spacers separating the wires by 25 mm. Printed results for the aerial showed 80 m, 30 m and 15 m was still a poor match, but 40 m, 20 m, 17 m, 12 m and 10 m had a good match.

The design looked promising so new wire lengths were cut and new ladder lines were made. I placed the spacers quite close together at first, but a measurement of the Velocity Factor showed it to be as bad as coax, around 0.62!. I cut out as many spacers as I dare, and finally measured the VF to be 0.87, not great, but Hobson's choice. This made the required length of the matching section to be 11.8 m (38' 8"), much longer than the G5RV type so it had to slope sideways much more, but resulted in its lower end being nearer the shack window. Connections to the SWR meter and rig were made and results were taken. I was impressed! First tests showed best VSWR on 20 m occurred below the bottom end of the band, so small lengths of matching section were cut off until the best match coincided with the CW section of the band. On 40 m, 20 m and 10 m, my most used bands, the VSWR came to around 1.2:1, almost good enough to use in an ATU free zone. On 30 m the VSWR was still very bad, but on 80 m, 15 m and 12 m the reflected power came to around 12 per cent (VSWR 2:1)), a general improvement on the G5RV. A pleasing effect of the new aerial is the disappearance of TVI experienced on our TV set, a cooler running ATU and the satisfaction that most of the power is going up and out into the world.

I wonder what the neighbours thought of the lunatic leaping around the roof wielding cables, cutters and soldering irons, and putting up enough rigging to keep the *Endeavour* happy. While I was up there, I decided to paint the roof, and then to make it easier to spot from the air I painted the word "OURS" across it, but that is another story. βi

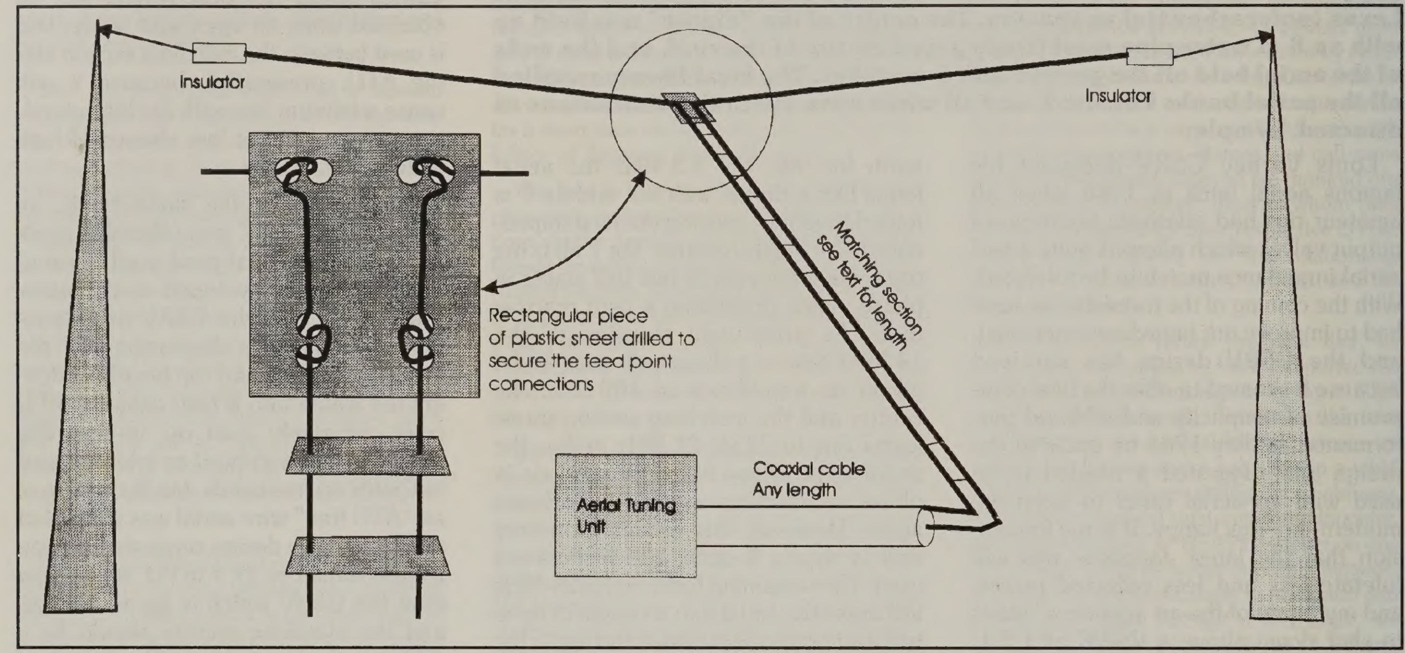
References

Practical Wire Antennas, J. Heys. 1989. RSGB.

HF Antennas for All Locations, L. A. Moxon. 1982. RSGB.

Practical Antenna Handbook, J. J. Carr. 1994. TAB Books.

Radio Communication Handbook, Vol. 2. 1978. RSGB.


Insulator
Insulator
Rectangular piece of plastic sheet drilled to secure the feed point connections
Matching section see text for length
Coaxial cable Any length
Aerial Tuning Unit

A typical G5RV installation.

ERRATA

Figure 1 was referred to on page 6 of the May 1996 issue of *Break-In*. No figure was printed.

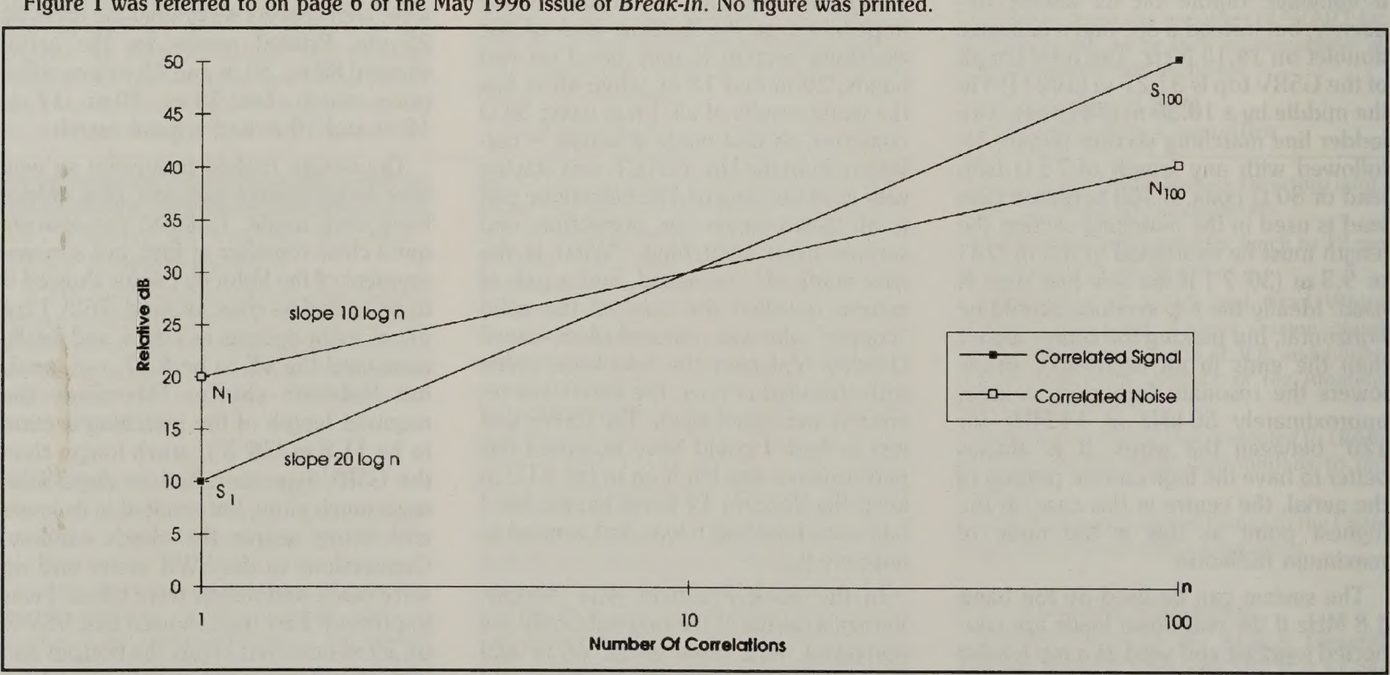


Figure 1. Illustration of improvement in S/N by correlation of signal repeats.

Null-steering antenna systems

The recent articles on the use of interference null-steerers have appeared in the Australian *Amateur Radio* by Lloyd Butler VK5BR (September 1992 and January 1993). The first article, "An interference cancelling system for your receiver or transceiver" presented the circuit details of a practical unit which made use of resistance capacitance (RC) phase shift networks to adjust the relative phase of the wanted and unwanted signals over the necessary 360° of phase. In his second article: "More on interference cancelling, and a new circuit", VK5BR makes use of the phase shift that occurs when a tuned circuit is set of resonance. His new circuit, Figure 1, despite its simplicity, can be adjusted over a full 180° of phase with a single tuning control, with the remaining 180° accessible by operating a phase-reversing switch.

VK5BR introduces this form of interference-cancelling as follows: "The idea is to use an auxiliary antenna (almost any random length of wire) in addition to the main receiving antenna As the two antennas are physically spaced from each other and also unlikely to have similar field patterns, the amplitude and phase of signals induced into the two antennas by an interfering signal can be expected to be different. This particularly applies to a localized interference source which is largely coupled into the antenna by induction. This induction field follows a different law of signal attenuation versus distance from that of the radiation field by which the distant desired signal is being received.

"The two antenna outputs are combined after modifying their relative signal levels and phase such that the interference signal from one antenna is equal but opposite in phase from that from the other antenna. The interference signal is cancelled but, as the two desired signals have a different amplitude and phase relationship, a resultant desired signal component is retained. Of course, for all this to work, the interference waveform must be continuous and reasonably stable in shape and amplitude. From my own experience, the system works extremely well for power line noise and frequency dependent noise bars generated by TV line time-bases and computers."

In Figure 1, L1-C1A and L2-C1B are the two tuned circuits coupled by resistor R2. L1 and L2 are identical and C1A-B a ganged variable pair. VK5BR states that in practice, tracking of tuning does not appear to be critical and there is no need to be too concerned about precise matching of the inductors. The circuit, as shown, runs fairly low Q and almost any identical pair of inductors can be used provided they are selected with the right inductance for the frequency coverage concerned. VK5BR uses miniature RF chokes which are convenient because they are no larger than a resistor or small capacitor, can be bought in precise values and save the effort of having to wind the coil. With 10 μH and 1 15–280 pF the tuning range covers 3.5 and 7 MHz; bandswitching can be added as shown in Figure 2. For 1.8 and 3.5 MHz use 39 μH; for 7 to 14 MHz use 2.7 μH; and for 14 to 28 MHz use 0.68 μH. Figure 3 shows how diode protection can be added when used in conjunction with a transceiver.

VK5BR writes: "To set for a balance, the phase and amplitude controls are adjusted for lower noise, one after the other a number of times, until an interference null is achieved. If a null is not found, or the null is not very definite, the phase is reversed with the reversing switch and the procedure repeated." In the earlier article VK5BR notes that apart from the forms of local interference already mentioned, he found that on the MF broadcast band a distant (interstate) station was normally completely swamped by a local station. After balancing out the local station, the distant station could be received quite well with only a slight amount of sideband splatter from the local station. In effect, it is rather like obtaining the benefit from swinging the null of a good frame/ferrite-rod antenna.

(Reprinted from *RADCOMM* March 1993)

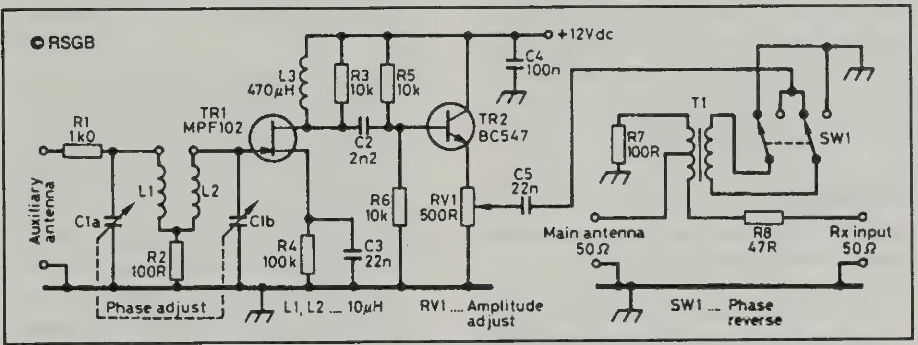


Figure 1. VK5BR's Mk2 interference cancelling circuit as described in the January 1993 issue of *Amateur Radio*. As shown this covers roughly 3.5 to 7 MHz. C1-2 ganged 15–250 pF variable capacitor or similar. L1, L2 miniature 10 μH RF chokes. T1 11 turns quadfiliar wound on Amidon FT50–75 m toroidal core.

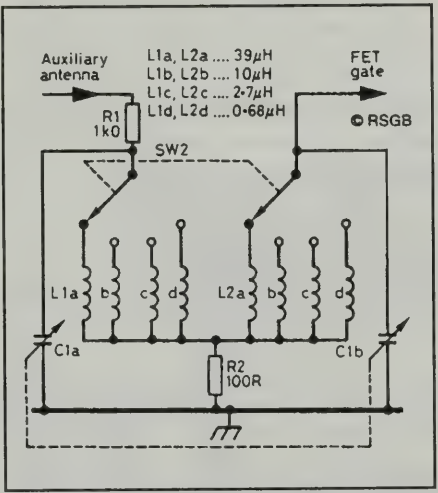


Figure 2. Bandswitching modification to provide 1.8 50 30 MHz in four ranges.

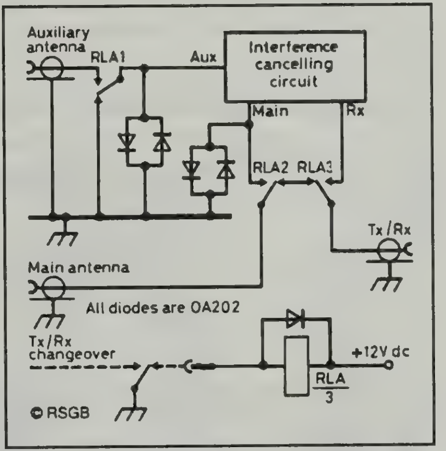
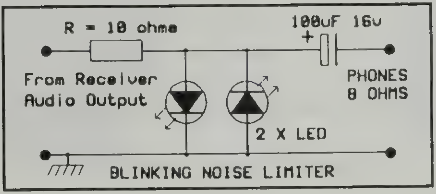


Figure 3. Transmit-receive switching with protection diodes for use of the VK5BR interference cancelling circuit with a transceiver.

A blinking noise limiter

You may have seen two diodes used in the output of a receiver to limit noise and make listening more comfortable. Well have you tried LEDs? You can adjust the level of the output from the receiver so that they blink as the loud noise crashed and this indicated that they are conducting so each blink is noise that is not damaging your eardrums! You may include a switch to bypass the limiter when it is not needed.

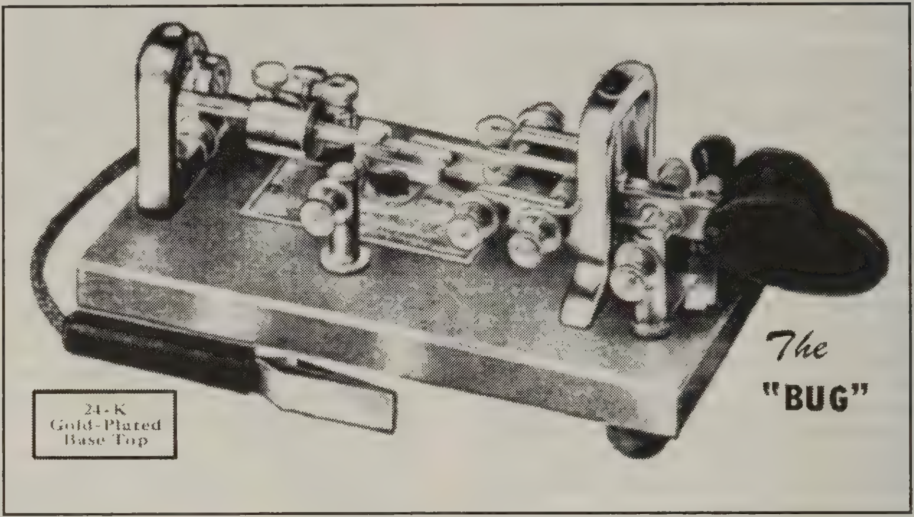
A useful circuit from *Sprat* No. 79, Summer 1994)



Adjustment of semi-automatic keys

by PETER J. RODDA ZL2UD

RECENTLY I overheard a ZL1 asking if anyone could tell him the correct method of adjusting his "bug-key", which made me wonder if there are others who may have semi-automatic keys and are unsure of the correct procedures for their maintenance and adjustment. If this is so the following information, taught to me in the early 1950s, may be of assistance.



Vibroplex Super DeLuxe.

Inspection

Examine the key for any mechanical defects. Check that the contact points are clean and in alignment, with the faces parallel. The lever pivot screw should be loose enough to permit a free movement of the lever but not so loose as to make signals unsteady. All supporting parts should be rigidly fastened.

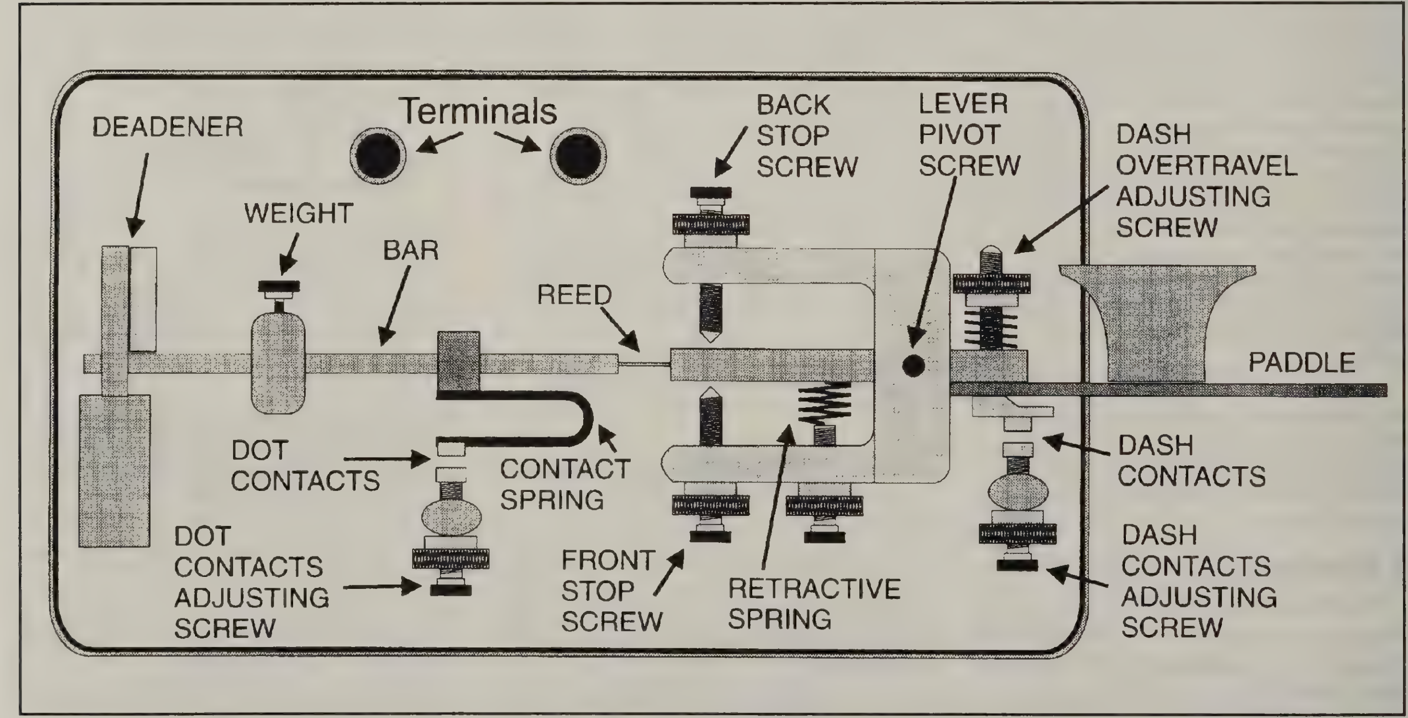
Adjustment

After inspection the key should be adjusted as follows:

1. Place key on a level surface.
2. Adjust the back stop screw until the beam lightly touches the "deadener", and tighten the locknut.
3. Adjust the front stop screw until the separation between the end of this screw and the lever is approximately 0.0038 mm (0.015") and tighten the locknut. A greater separation is permissable if the operator prefers more lever movement.
4. Operate the lever to the right. Hold in this position and stop the vibration of the beam. Adjust the dot contacts until they just "make" without flexing the contact spring and tighten the locknut. As this is a very important adjustment it should be checked after setting the locknut to see that it has not changed.
5. In case the dots are too heavy or too light, move the weight which is provided for regulating the speed (and which should be kept well toward the outer end of the beam) nearer to the outer end.

Note A: After the key has been adjusted as above, do not change adjustments to correct light or heavy signals except by moving weight toward the outer end of the beam.

Note B: Keys equipped with two weights should always have one weight near the outer end of the beam. βi



Vibroplex semi-automatic "Bug" key.

ZL8RI

The Kermadec Islands Story

by L. F. (LEE) JENNINGS ZL2AL

"NEVER heard anything like it", "Gawd help us", "Amazing", "Listen to this—a pileup from 14200 right up to 14300!". Just some of the comments we used to describe the monster pileups that ZL8RI generated. Our journey to Raoul Island was long awaited by the international DX community. This is the story of how ZL8RI happened.

Actually a major DXpedition doesn't just "happen". It takes about as much organization as a NASA space flight (and costs about the same!). After operating ZL7AA in 1993, I was hooked on pileups. A rumour that the Kermadecs was in the planning stage surfaced in late 1994 through a close friend, Ron ZL2TT. I put my name forward. "Ken who?" I said, when I learned that the organizer was not some well-known, Honor Roll DXer. My first meeting with Ken Holdom ZL2HU in 1995 confirmed that Ken was a "detail man" and a very skilled administrator with plenty of experience in dealing with government departments that thought that Raoul Island was the preserve of a few well-heeled, grey-shoed scientists and visiting dignitaries from New Zealand. The Department of Conservation (DoC) was demanding passports, dictating terms, and offering very little. During 1995, the letters flew around the houses of bureaucracy in New Zealand with gay abandon. Eight loose-leaf binders, full of hundreds of letters to everyone except the Queen and the Sultan of Brunei was testimony to Ken's dogged determination and belief that it would happen and he was going to make it happen.

By late 1995, DoC had not only heard of Ken, but was eagerly offering us facilities on the island (at a price), and couldn't wait to issue permits as long as they could be convinced we wouldn't be smuggling wild and exotic fauna and flora off the island, or introduce mice to the island. I never was a gardener and don't like parrots anyway! The Radio Frequency Service eventually issued our requested call of ZL8RI, and the DoC and other government departments all capitulated in time. Permits were very specific for landing on the island. No earlier than dawn of May 4 and to be off the island by May 14. The beginning of 1996 saw the team firm up as Ken ZL2HU, Ron ZL2TT, Lee ZL2AL, Chris ZL2DX, Al WA3HYN and Bin JA3EMU. Peter ZL3GQ joined us in the two months before we left. The seven members of the team had over 220 years of amateur radio experience between them. 5BDXCCs, 5BWAZs and DXCCs were plentiful among the team. Five of the seven members were active CW operators. From the outset it was apparent that our combined contesting and DXing experience would be invaluable on Raoul Island.

Early meetings showed that a DXpedition of this size was almost an impossible challenge. Obtaining $45,000.00, a 25 m ship, generators and five drums of diesel were the major problems. Operating gear, computers and antennas and food were another. Getting all the gear there and back was daunting. Hundreds of letters went out to DX clubs worldwide. Financing a major DXpedition is like collecting money for charity. Climbing K2 would have been easier! But, as time went on, finances were looking "possible" in late 1995. Response was muted at first and help came slowly. Class organizations like the INDEXA, NCDX, RSGB, CDXC, EUDXF, LADXA, Clipperton DX Association, Danish DX group, JA DX groups and other small clubs worldwide promised finance because Raoul had not been operated significantly since the early 1980s and was the number one most wanted country in Europe and was in the top ten on most club lists worldwide. Individual hams that needed ZL8 helped with some amazing donations. March 1996 brought the news that YAESU and NAGARA Antenna Company would generously help with equipment and QSLs. Brilliant! We all heaved a sigh of relief and planning took on a new urgency. ZL8RI was rapidly becoming a reality.

History

Raoul Island is the largest island of the 15 islands in the Kermadecs group. They are 1000 km off-shore from the northern tip of New Zealand midway between Auckland and Tonga. The Kermadec Islands are actually the peaks of submerged volcanoes which rise higher than Mt Everest from the 10 km depths of the Kermadec Trench. This ocean chasm, one of the deepest in the world, formed from the subducting of the Pacific Plate under the Indo-Australian Plate. Raoul Island is the 3000 hectare northernmost island in the group, with sea cliffs soaring up to 250 m. Basically Raoul Island is a live volcano! Wisps of steam still rise from a gaping caldera in the centre of the island. Three lakes lie in the craters of past eruptions. The last one occurred in 1964 when black mud, steam and rocks shot up 8000 m. Earthquakes, one as recently as a year ago, still scare the pants off the few DoC officers who live permanently on the island.

Lee ZL2AL in the cockpit.

Cyclones are regular visitors and, although the climate is sub-tropical, weather surprises are often in store for the unwary. Oranges, bananas and passionfruit will grow, and indeed, a visitor to the island in the late 1980s recorded 54 species of exotic plants. The island was privately occupied by the Bell family from 1878 until it was annexed by New Zealand in 1937. Prior to the Bells, it was a whaler's and seabird's paradise. In 1990, the Department of Conservation created one of the largest marine reserves in the world when it protected 7,400 sq. km of sea and coastline around the Kermadecs from exploitation and damage. Water temperatures are 3–4°C warmer than the coastal waters of New Zealand. Raoul, the only weather station in the empty seas north of New Zealand, is an important link in the global weather network.

Peter is the one with the YAESU shirt on. Ken ZL2HU is third from the left. This is the morning we arrived 7 am with Raoul in the background.

The beginnings

The plan was to assemble at Lee's home in Hastings at the end of April, welcome our overseas visitors, spend a few days getting to know each other, load the ship and plan operating strategy. We were assuming that there would still be the odd sunspot left for us but I personally believe that Mother Nature is married to Murphy and that unholy alliance has the potential for disaster at the best of times. We simply decided to ignore the sunspot count, K Index and other things solar and hope they would ignore us. The final meeting of the New Zealanders took place at the end of April, one month before departure. Ken confirmed we had finance in the bank to at least get there. The last month seemed to compress into a few days. Finally Al and Bin arrived from overseas in Wellington to meet Ken. Peter arrived from the South Island and the full team arrived in Hastings on April 28 for the last few frantic days of checking, procuring items we had missed on earlier lists and making last minute changes to some of the gear. Cutting coax lines, checking connectors and packing expensive radios in waterproof plastic wrapping was completed. Simple things like remembering a drum pump for the drums of diesel fuel could prove embarrassing. There is no electronics emporium on Raoul Island. Forgotten items could cost us dearly later. It was also a time that we got to know Bin and Al. They soon found out what "The Kiwi way" is. It is to go with the flow. It is to improvise and change on the run. It is solving problems before they arise.

April 29 saw us inspecting and beginning the loading of the Yacht *Evohe* at the Port of Napier which is situated 14 km from Hastings. The *Evohe* is a 25 m, two-masted, steel-hulled motor sailer ketch with all the latest Sat-Nav equipment on board. The yacht can accommodate seven crew and 14 passengers and has sailed to all parts of the globe. Safety was our concern and the *Evohe* met our requirements easily. Ron and Lee went to the local supermarket and bought food and provisions for the 11 days we were on the island. The manager rubbed his hands in glee as he took delivery of his new Rolls Royce. The evening of departure was party time with 20 or so local ZL hams at Lee's home to wish the team well. Anticipation was at fever pitch and few of us slept well that night.

The voyage

The following morning saw us all up early and at the wharf. We were ready to go at 0900. Unfortunately the captain wasn't. Neither was the ship. At 1300 after frustrating passport, customs and fuelling delays we departed Napier. Four hours out after a fine cruise the weather turned worse and most departed the decks and went below. Twenty-four hours later saw us 220 nautical miles on our way in rough seas with 5 m waves, the bow pitching 7 m and the yacht rolling 30° in a following sea. And then it got worse! A simple exercise like walking from your bunk to the main cabin was fraught with danger. Several were thrown around the cabin or companionway into fixed furniture. The offer of dinner brought polite refusals from all of us. Most of the team ranged in colours from a whiter shade of pale to a nice puce bordering on green. Most lost weight. Ron's bloodshot, pleading eyes over the top of a paper bag told the story.

Occasionally, between the northerly storms and fronts we sailed through, a lull saw Al and Chris operating the IC-735 which was part of the yacht's radio gear. Good DX was worked with an L-shaped vertical winding its way up through the masts and rigging. More importantly, we were able to communicate with our ZL friends in New Zealand who excelled in keeping our families informed. As each degree of latitude decreased on the GPS we noticed it was getting warmer and the seas got rougher. Rolling 30° side to side and pitching 8 m at the bow was a nightmare; if you could have one. Sleeping in the forward bunks was impossible with your bed disappearing 8 m below you in a few seconds, followed by the same rise which compressed one's stomach with the G-force of a stunt pilot's aircraft. The rest of the trip to Raoul Island was more of the same. We all existed in a trance-like state in a twilight zone waiting for the end.

Arrival

Suddenly it was over. Raoul Island appeared like a dark cloud on the horizon early in the morning of May 4. By 0800, Keith Springer, the officer in charge of the Department of Conservation on Raoul had been contacted on marine VHF for assistance in getting ashore. We moored on the north-east side of the island at a place called Fishing Rock which has a gantry crane and flying fox operated by DoC. We surveyed this dormant but active volcano and it suddenly became obvious why landing is difficult. Rough seas, rocky beach, difficult access and a daunting 200 m cliff face to climb presents major problems.

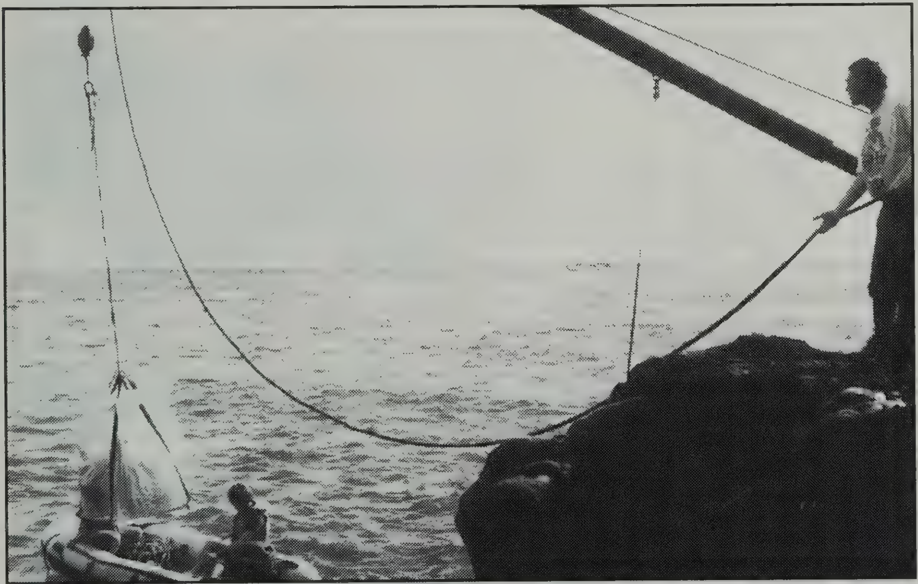
The procedure for landing is simple. Get the gear out of the ship's hold and into a Zodiac. Race the Zodiac to shore with the gear in the cargo nets and make a flying pass at the crane hook. Snag the net full of gear on the hook as the Zodiac pitches up and down a metre or so in the swell. Dodge the load as the crane winches it up and swings it around onto the rock. Load the gear onto the flying fox and watch it disappear up the cliff face to the top of the foxway. Unload the gear from the net and onto a large trailer pulled by a tractor and drive the load about two miles to the "woolshed" which is not a woolshed at all but a tiny four-room house. Repeat this procedure many times and many hours later we are ready to set up.

It was homecoming for Chris ZL2DX who worked on the island in 1986 as a mechanic. It was his job in New Zealand to dismantle a tractor into little pieces, bring it to Raoul, transport the pieces up the foxway and re-assemble the beast at the top. You guessed it. Same tractor. Chris's eyes were moist. People are not allowed the luxury of the travel up the fox. They walk, if they manage to survive the hazardous transfer from the Zodiac and the scramble up the rock to the base of the crane. "Between a rock and a hard place" takes on a whole new meaning when you have just seen a shark circling the yacht half an hour before you make the landing. You become very determined to make the rocks the first time between the swells. The water is not an option.

Set-up

Finally we had arrived and it was all on. "80 m in the kitchen", "40 and 20 m in the bedroom", "Let's put the FT-900s on 12 and 17 in the small room", "Bunks in there", "That 40 m pine tree would make a great antenna support", "Get the generators into the hut", "Anybody know where the roll of coax went", "Who's got the soldering iron", "Where's the FT-1000 manual", "Oh no", "The boom mike headset connectors won't fit the FT-900s", "Think I'll make a pot of coffee".

And so it went on for the next 24 hours. Two tri-banders, a WARC duo bander, and four verticals went up without mishap. "Slingshot Al" WA3YVN used his device with deadly accuracy to place lines up over the huge Norfolk pine trees just outside the operating shack to hoist the huge delta loops. All antennas went up without mishap. Bin JA3EMU produced an antenna analyzer "black box" out of his tool kit and pronounced that the systems would work. Even the generators co-operated for a while. We started to come to grips with the rats, cockroaches and ants which had obvious designs on our food stores. The DoC staff on the island invited us for a BBQ that night. Should we take three hours off? Unanimously yes! And what a pleasant affair it was with the DoC staff turning on a very informal, but typical Kiwi welcome. The team left as soon as socially acceptable and returned to getting on with the set-up in spite of the lack of sleep over the previous four days. Anticipation grew. Murphy was around in minor ways but he was tired too.



Chris ZL2DX operating the gantry crane lifting the gear out of the Zodiac. The *Evohe* is in the background.

We're on the air!

Initial plans called for getting each station on air as quickly as possible. Al suggested that we wait and go on the air with a full operation, making the most impact possible. Reason prevailed even though we were all wanting to get the first QSO in the log. Individual operator schedules were charted on the wall. It was agreed months earlier that the first QSO belonged to Ken ZL2HU. May 5, 1996, at 0410, ZL8RI on Raoul Island was on the air with the first major operation in 12 years. We tried to prepare Ken for what some of the more experienced members of the team knew would happen when he called CQ on 14.195. He made his call, released the boom mike VOX and stared at the radio in disbelief when he was "jumped" by over a thousand screaming voices covering 20 m up to 14.250. AA2GQ got the first one. Ken worked a few more, turned the mike over to Al and was visibly shaken by his encounter with serious pileups. You could take any band, call CQ and hams all over the world were waiting. Five minutes later we hit the Packet clusters and all hell broke loose. It was hour after hour of adrenalin pumping ham radio at its best. Ron was waving his hands around and shouting "sayonara" while Peter ZL3GQ grasped the Bencher paddle like he was holding onto a $1,000 bill.

If DXers are seen by the rest of the ham radio community as a little "funny" then DXpeditioners are really the "lunatic fringe of ham radio". We were over the moon at the interest ZL8RI created. Constantly monitoring our progress on K1EA's CT logging program showed CW rates approached the 200 per hour while SSB rates soared to 300. Hour after hour it went on and they still kept coming. It was amusing to log some of the more unusual ones. Beaming the USA on 15 m produced an EA9. Out of a horrendous pileup on 80 m SSB popped K6UMB/M. One of the latest QSOs was a VE3 operating portable in Syria. Twenty-four hours later we started posting QSO totals on a wall chart for all operators. Totals were taken from the computers and hand logs each day around 1600. The first day showed nearly 5,000 in the log. Peter ZL3GQ and Bin took over the RTTY and CW operations on the lower bands with great success. During the last weekend of ZL8RI, the Volta RTTY Contest was on and Peter and Al found themselves very popular indeed. Bin spent the evenings on 160 m and 80 m trying to give vital lower band contacts to as many as possible amongst appalling QRN. Many Ws, JAs and VEs were worked. We had originally targeted 30,000 QSOs for the operation and were tracking our target well. Operators settled in to daily routines. Some enjoyed the night work. The division between day and night became blurred. Sleep was difficult with the noise of generators and QSOs ringing in our ears.

I have a small electronic alarm clock which emits a repeating "dit-dit-dit-dit" when it goes off. One night, at 0200, when it went off to remind me of my late shift, I awoke with a fright, mentally looking for S51H. As the crickets chirped outside the tent in the silence of the night, the reality dawned on me that pileups were taking their toll of my mind. I was losing it! Europeans peaked from midnight until about 0400 local time on 20 m and I used that opportunity to give them some joy. Europeans were difficult to work at the best of times. They tripped over themselves in the pileups. Some countries in particular thought that the best way of working DX is to find the centre of the pileup, crank up as much power as possible, set the keyer to 40 wpm and let loose. They did not fare well with us. QSO rates dropped to 50 or 75 per hour but we persisted because we tried to give every area in the world a fair share of air time.

How to work DX

Meal times provided a little sanity to our existence. Aside from comments and compliments to the chef (we all cooked), talk revolved around the huge pileups and how it all was going for us. Accolades on our operation were welcomed. We often talked about how many hams missed us and why they were not successful in the pileups. DXpedition ops always take the path of least resistance. The easiest to work. It either comes down to a very loud, clear, properly modulated signal on the top of a pileup or working the "cunning foxes" on the side of the pileups. These "foxes" would look at the width of the pileup, position themselves on the up side just out in the clear, but very, very near the edge. They would then call about 15 wpm on CW or slowly with proper phonetics on SSB. Short calls followed by listening for four seconds (that's as long as it takes us to load their call into the computer) produced the results every time. No result and the foxes would repeat again and again, same rate, same method and they got my attention because they were easy to work. The Gs, OHs, ONs and SMs were good at it. The Ws are better. The JAs are masters. I asked Bin JA3EMU why the JAs were such superb, discipline operators. The answer is formal training in their clubs. I wonder how many clubs around the world actually have experienced DXers teaching their members how to be effective operators. Power, compressors and big antennas pale into insignificance when compared with style, experience and cunning.

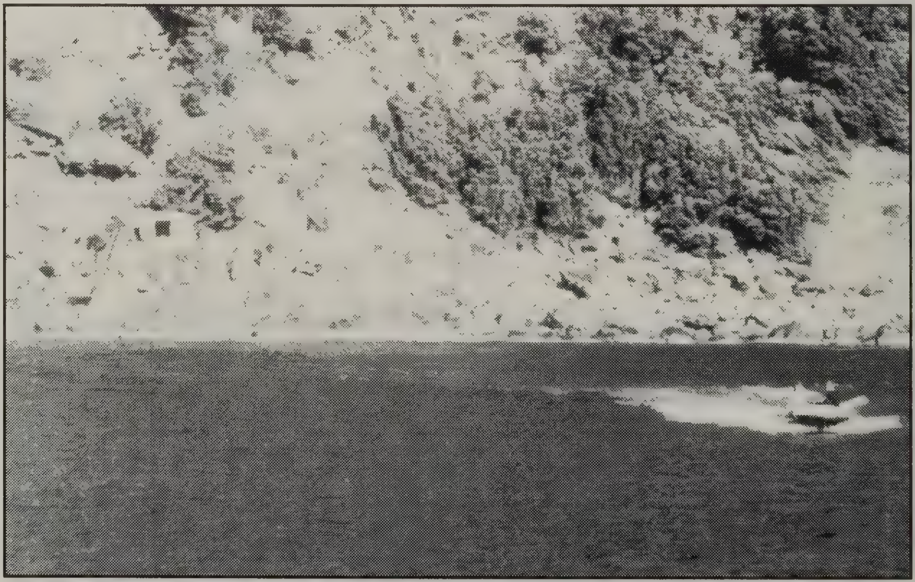
The great volcano trek

Since we were on a live volcano, we though that we should go and see a live volcano. Ruth, a farmer from Tuatapere in the South Island and a volunteer DoC worker for only four months, offered to guide Ken, Peter, Ron and I for a morning trip to see the crater. At one time the island was a paradise for sea and land native birds, but the introduced goats, rats and weeds have caused major ecological problems. The goats ate the native shrubs and trees, the rats raided the nests and ate the birds' eggs, the remaining birds spread the weed seeds. DoC eliminated the goats about 12 years ago. They are keeping the weeds under control and eliminating some species. The rats are everywhere and will be dealt with when the weed problem is solved. Then, so the theory goes, the native and sea birds will return. The birds are plentiful on adjoining islands where there are no rats. Somehow I had this funny impression that one walks to the crater and looks down into it, suitably impressed. Wrong! The Raoul craters (three of them) rise up out of the island nearly 300–400 m and you have to fight your way up narrow tracks for an hour or so to get to the lip of the rim. You then descend down into the crater through bush.

Bush? The island is, in some places, dense bush with pohutakawa, rimu and other native trees and shrubs. The volcanos haven't erupted for many years in any sort of major way and there is a thick native forest cover on the island which makes the going hard at times. We finally made the warm lake in the cauldra of the crater and watched live steam vents on the side of the crater and hot gas vents at the edge of the Blue and Green Crater Lakes. The remains of twisted and knarled trees lay strewn around the ground, evidence of the 1964 eruption. On average Raoul erupts every 30 years. It has been 28 years since the last one and although it may have been my imagination, we made the trip back to the rim of the crafter a little quicker than it took to go in. A very enjoyable trip and our gratitude and thanks must go to the local DoC staff for the opportunity to visit the craters.

Murphy strikes

We were growing more tired with each day but the daily totals kept mounting and our target chart showed that we could achieve our goal. And then Murphy struck on May 12 early in the morning. One of the two 5 kW generators seized and died. Within minutes, all unnecessary power drain was cut, some linears turned off and we reduced to three stations. Within 24 hours one of the tribanders developed trouble. No signals. Dummy load. The team pressed on and totals still mounted but it was obvious that Murphy should not be tempted again.



The Fishing Rock landing site with gantry crane and fox hut in the background.

Generators and gear going up on the flying fox.

Our licence and permit dictated that we must be off the island by May 14. During the preceding 24 hours all non-essential equipment and gear was re-packed and boxed ready for the trip home. The last QSO with UR4LCH at 1600 UTC passed unremarkably on the morning of departure. Daybreak. The team worked feverishly at taking down the antenna systems and loading the trailers ready for the trip back to Fishing Rock and the gantry crane. DoC staff arrived at 1000 and started moving the tons of equipment. We carried the computer log disks by hand. One of our contacts in the USA during the last few days quipped: "If the boat sinks, make sure you save the back-up disks." Ron, who went with the first load to the top of the foxway, reported on VHF that the tractor had broken down after the last load. Murphy strikes again! We had to walk the 3 km out to the foxway. It was a beautiful morning and the sun shone so the trip along the top of the cliffs gave us a good chance to look down on the beach and out to sea where the *Evohe* was moored waiting for the Zodiacs to fill her hold with our cargo.

Homeward bound

Early afternoon came and we said our goodbyes to the DoC staff, some of whom came aboard and seemed almost sad that we were leaving. We set sail for home, detouring around to Boat Cove in the south shadow of the island where the yacht *Shiner* was lost during the successful 1984 DXpedition to Raoul Island. It was an interesting but melancholy place.

The journey out past Meyer and Napier Islands was memorable with flat seas, glorious weather and "Pink Floyd" on the yacht's stereo. The captain made for L'Esperance Rock, an extinct volcano cone rising 500 m out of the sea and a hazard to unwary sailors. Surf pounded on the rocks as two of the crew went diving in the crystal clear waters of this marine reserve. Ron ZL2TT and Al took the Zodiac out around the rocks for photographs and a little sightseeing adventure while Ken and a few hardy crew members had a quick "dip" while the yacht's crew kept a wary eye out for vertical fins in the water. "What did you see below Roger?" I asked one of the divers. He replied that there was a large 30 kg groper on the bottom, hundreds of kingfish, the odd shark, and at times huge schools of reef fish that obscured his diving partner only a few feet away. "Quite beautiful," he remarked. I came close to giving up ham radio at that point for a new hobby of diving. Reason prevailed. The allure of a good CW pileup was still too much.

A few hours later we set sail for home as clouds loomed on the horizon. Most of the team went below for a bit of much needed sleep, the first long stretch in two weeks. Most of us slept for 15 hours or more. The trauma of the past few weeks had taken its toll. We awoke to worsening weather. "You're not going to like this!" the captain said. He had heard the weather reports. Weather worsened with southerlies coming up out of the Antarctic and up the east coast of New Zealand. The yacht was rolling and pitching again. It was obviously going to be "The Voyage from Hell—Part 2—The Reutrn". The weather was even worse than the journey to Raoul with huge seas, 40 to 50 knot winds and angry white, frothy spray blowing off the top of mountainous waves. Food was running low and the will to eat was even lower. At 0300, about 30 hours before our ETA at the Port of Napier, one of the two diesel engines developed fuel problems and failed. Still, one engine and sails would get us there eventually. Our speed was slashed to 4.5 knots and the rest of the voyage from hell was extended another 15 hours. A few hours out from Napier, the seas calmed and went flat, the sun came out and we went up on deck again. Nice touch. Eight days sailing and we were able to spend only a total of seven hours on deck to enjoy. Unfair, but it was all worth it. We were home safely and had accomplished what we set out to do.

Statistics

Yaesu FT-1000, FT-1000MP, FT-900 (2), FL-7000 amplifier. Heath SB220 amplifier, SB200 amplifier. Icom IC-2KL amplifier. Nagara tri-bander, WARC duo-bander. Cushcraft tri-bander. Create 10–40 m vertical. Cushcraft R-7 vertical. Create 160 m vertical, 80 m Delta loop, 40 m Delta loop. MFJ 982 Versa-tuner (2). Bencher paddles. Laptop computers (6). IBM 286 clone. CT logging program by K1EA. 5 KW diesel generators (2). Teddy bear mascot (Ron's).

Band totals

(Roughly) 160 m 300, 80 m 2,300, 40 m 5,200, 30 m 1,300, 20 m 10,500, 17 m 5,000, 15 m 6,800, 12 m 1,600. 10 m, 900.

Totals

33,900 QSOs. 13,800 CW, 19,100 SSB, 1,000 RTTY.

Sunspots—12? You've got to be joking! Sounded like 200+.

Acknowledgements

Warwick, Clea and Bruce of the New Zealand Department of Conservation (DoC) were extremely helpful once we got to know them. Without their helpful advice and suggestions ZL8RI would not have happened. The DoC team on the island were a fine group of talented young New Zealanders with outstanding physical fitness. They taught us much and we could not have done it without them. Their co-operation was excellent.

The YAESU Corporation of Japan supplied the two FT-1000s, FL-7000 linear amplifier and the two FT-900s. The YAESU gear worked flawlessly and ran cool to the touch. We couldn't kill them.

The FT-1000MP was a joy to use. You forgot about the radio and got on with the business of the pileups. The receivers capability was mind-blowing and "transparent" to the operator. It was the best radio I have ever used in 44 years of ham radio. The FT-900s were surprisingly agile and capable for a small transceiver. The new Collins mechanical filter in the FT-900 offers great selectivity performance with CW selectivity that goes on forever.

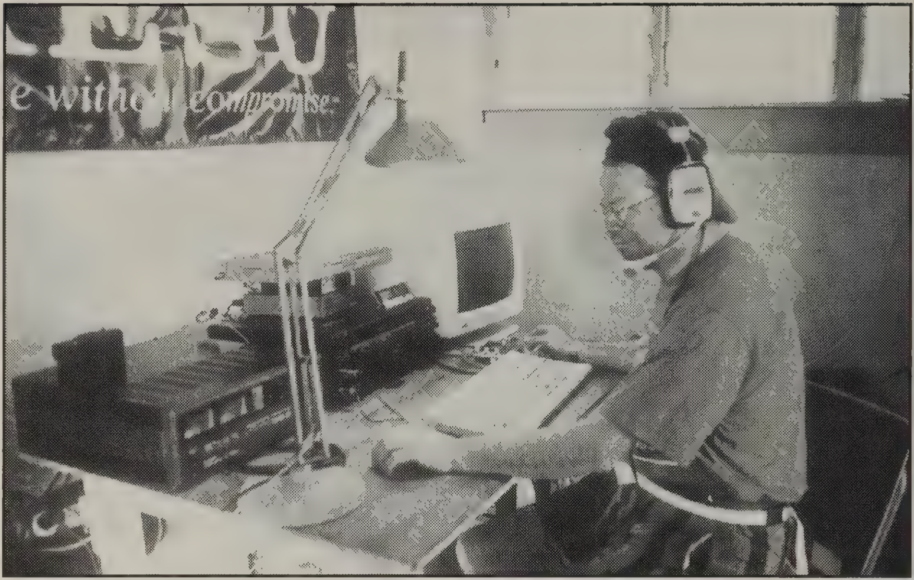
The NAGARA antennas worked extremely well. Their tri-bander has all the elements driven like a log periodic and its performance and narrowness of beam was such that you could point it at any given country and you heard little else. Their WARC duo-bander was a joy to use and would be a worthwhile addition to any antenna farm.

The CREATE 40 m–10 m vertical worked better than our 40 m loop. Usually I don't like verticals.

The CUSHCRAFT R-7 loaned to us by Phil at Ham Radio Direct in New Zealand worked very well.

Thanks to MM Cables of Christchurch and Dick Smith Electronics in Auckland for their generous donations of coaxial cable and connectors.

NDEXA and NCDXF helped us considerably with finance. We are extremely grateful for their help.



Ron ZL2TT operating.

Most of use would have been hard pressed if we had to make a rational decision whether to divorce our wives or go to Raoul Island. Thank you to our wives for not putting us in that position and supporting our dreams. Thanks too, to all the amateur radio organizations and individual hams around the world that put their money on the line and put their faith in us that we would make it happen.

It was a trip of a lifetime for all of us. And yes, we are thinking about the next one! βi

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Note

A 40 minute PAL standard video tape of the DXpedition is available from the author. The price is NZ$30.00 posted anywhere in New Zealand or US$30.00 posted anywhere in the USA. Send money order to: L. F. Jennings ZL2AL, PO Box 54, Hastings, New Zealand.

THE TEAM.
Left to right: Al WA3YVN, Peter ZL3GQ, Lee ZL2AL, Ken ZL2HU, Chris ZL2DX, Ron ZL2TT, Bin JA3EMU.

AMSAT Phase-3D

The new Amateur Radio Satellite

An overview of this major project due for launch 1996/97

by IRVING SPACKMAN ZL1MO

BASED on current data (April 1996), AMSAT-AO-13 will re-enter and burn up in the earth's atmosphere early in December 1996. AO-13 was launched from Kourou in French Guyana on June 15, 1988, by the first test launch of the Ariane-4 rocket. It was the third Phase-3 satellite to be built by AMSAT, and the second to make it to orbit.

The Phase-3 satellites follow an elliptical orbit around the earth, with the highest point of the orbit about 40,000 km, thus the satellite can see a large portion of the earth's surface, and as such be available for use by amateur stations in any part of the earth, some times for up to 11 hours during a 24 hour period.

Unfortunately for AO-13, a variety of physical effects, such as the time of launch and the orientation of the orbit in relation to the sun and moon, resulted in a slowly changing orbit which, due to gravitational influences is decaying much more quickly than most other spacecraft in similar orbits. Thus its lifetime is now numbered in days, not years.

This phenomenon was only discovered by astro-physicists, thanks to the flight of our satellite, and had never been investigated before. Future spacecraft launches will now take this phenomenon into account.

The new satellite to replace AO-13 (currently called Phase-3D) was conceived in 1991 and is being constructed as a worldwide co-operative effort of most of the AMSAT groups. The following countries so far have been involved in the conception, the construction of individual modules and the major assembly of the project.

Belgium, Brazil, Canada, Czech Republic, Finland, France, Germany, Hungary, Japan, New Zealand, Russia, Slovenia, South Africa, the UK and the USA. Others have provided financial support.

AMSAT Phase-3D differs from its two predecessors, particularly in its size. It is approximately 10 times as large, and nearly four times as heavy as AO-13. The size comparison can be readily seen in the diagram. With solar panels extended, the spacecraft will have a diameter of nearly 6 m. More than half the launch weight will be taken up with about 250 kg of the various rocket fuel materials. At the beginning of their life, the solar panels are capable of producing nearly 600 W of power, permitting the use of much higher power transmitters.

One of the prime functions of Phase-3D is to make space communication possible for the amateur community without the need for large antenna arrays, tracking systems, appreciable uplink power and low-noise receiving systems being necessary at every ground station. So contrary to previous approaches, it was decided to put high gain antennas and powerful transmitters on the satellite, thus making life easy for the ground stations. Whilst this is a very costly approach, it is a very cost-effective one.

The satellite is equipped with a vast array of transmitters which can be interconnected via a switching matrix as required. As can be seen the coverage starts with 21 and 28 MHz HF frequencies, extends through the traditional 2 m and 70 cm bands, includes the currently used Amateur satellite 23 cm and 13 cm bands, and adds the only dedicated amateur allocation for 10 GHz and 24 GHz to allow amateurs to develop skills with these frequencies which are in current use by other services.

Emphasis is being placed on the higher frequencies, not only to reduce pressure on already overloaded VHF amateur spectrum space, but also to accelerate "use it or lose it" moves into our other allocations, which are coming under extreme pressure from other commercial services.

All current analogue and digital operating modes are catered for. In addition the RUDAK module will allow development of other digital techniques, which require wide-bandwidth, coupled with high-speed processing, such as Amateur Analogue and Digital TV, high-speed data and transmission of pictures from two on-board colour cameras (differing focal length lenses). The pictures taken from various points around the orbit will be compressed and transmitted to the ground. RUDAK will have a total of eight modulators fed from 12 demodulators distributed among the various transmitters and receivers.

In order to maintain optimum conditions, the satellite will use three-axis stabilization to position the spacecraft so that the antennas point at the earth at all times. Orbital determination will be assisted by the use of data from the Global Position System (GPS), a first for satellites of this type in orbit. Several GPS receiving antennas will be mounted on the same face as the many other communication antennas. Using the special GPS navigation technique, Phase-3D should always "know" where it is around the orbit, and be able to generate its own "Keplerian elements" which will be downlinked to ground stations at frequent intervals.

Talking of antennas—the side of Phase-3D which will always face earth is a REAL antenna farm. There are three folded dipoles for 2 m; six of a new design "patch" antenna for 70 cm; a short "backfire" antenna for 23 cm; dishes for 2.4 GHz and 5.6 GHz; horns for 10 GHz and 24 GHz; the GPS antennas mentioned previously; all surrounding the main propulsion motor nozzle! In addition the antennas for the HF equipment will be integrated into the solar-panel "wings", unfolding with them once the proper orbit is attained.

Even if you don't initially use a satellite station, Phase-3D is designed to keep you up to date with the latest news. The South African contribution is a special 10 m AM-compatible transmitter with about 200 W output. When the satellite is close in to the earth, this transmitter will broadcast voice messages about the satellite status, news about other amateur satellite activities, and Amateur Radio news in general. This signal will be strong enough to receive on a standard HF receiver.

Depending on whether Phase-3D is launched on older Ariane-4 of the new Ariane-5 (our paid-up contract with Arianespace assures one or the other) we should be left sitting in either a 200 km or 500 km high transfer orbit. Following the firing of the on-board 400 Newton thruster motor several times, Phase-3D (which by now will have been allocated an OSCAR number) will be in a 4,000 km perigee, 47,000 km apogee orbit, inclined about 60°. At this point the winged solar panels will be unfolded and after a period for tests and commissioning, the satellite can be placed into service.

In order to reach the desired final orbit of 63.4° inclination, and for regular fine-tuning of the orbit, a newly developed electrical ARCJET thruster called ATOS (another first for spacecraft) will be used. This unit develops a small thrust of about 0.1 Newton using ammonia gas plasma produced in an RF arc. Over the course of about a year, ATOS will "nudge" our satellites into the final 16 hour orbit that will provide daily access for up to 16 hours per day in the Northern Hemisphere and slightly less from the Southern Hemisphere.

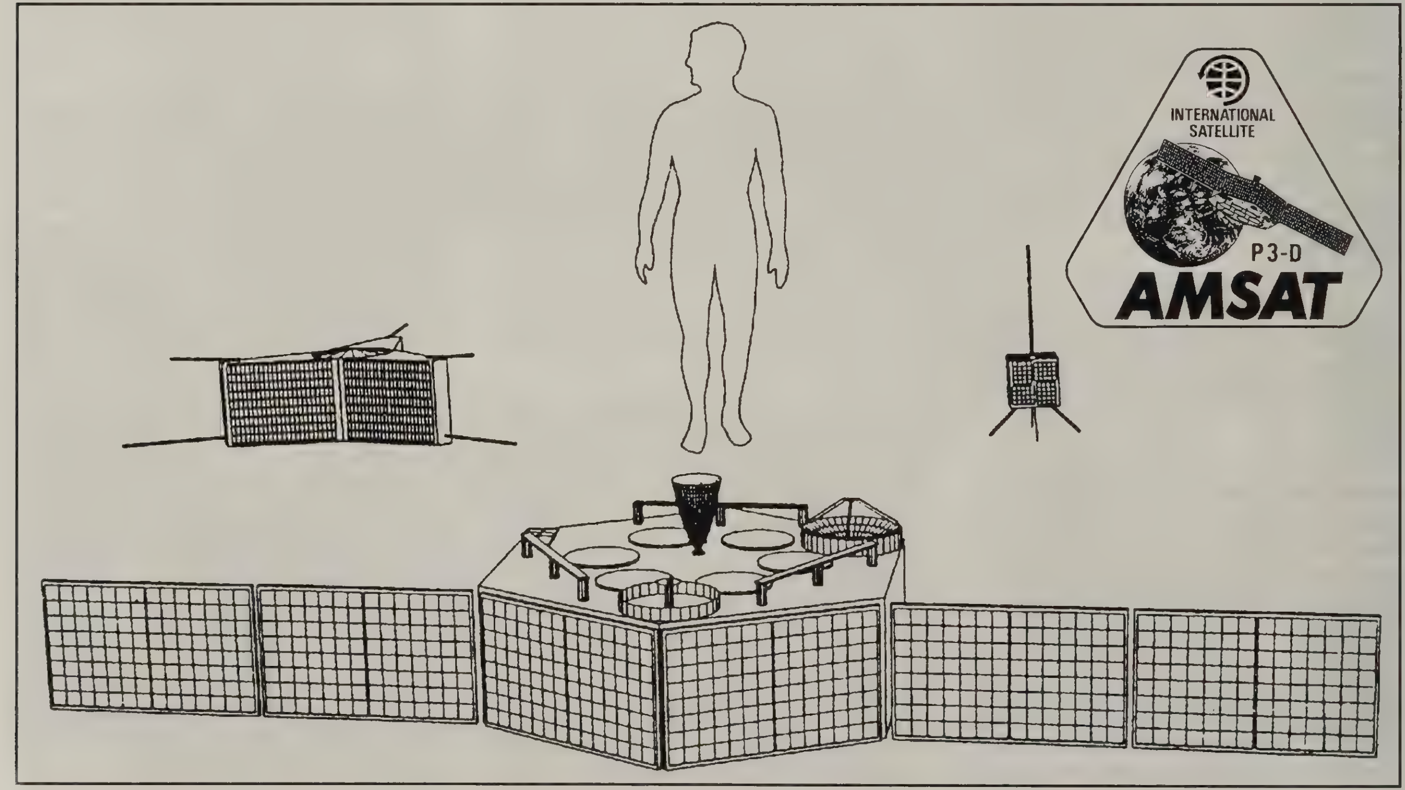
Phase-3D is planned to take the Amateur Satellite Service (and Amateur Radio as we know it), straight to the 21st Century! You won't be at the mercy of sunspots, antenna restrictions, zoning or planning constraints, or neighbour problems. If you wish you will be able to enjoy discrete, low-profile amateur operation! But this project is a "costly" one. To conclude this overview let's look at what has been achieved and what has yet to be tackled before the spacecraft can be launched.

Back in 1991 the German Radio Club (DARC), representing nearly 60,000 German Amateurs, agreed to assist AMSAT-DL with funding of about US$10.00 per member over a six year period (total US$600,000). AMSAT-NA members have donated (to November 1995) US$665,000. The ARRL has done a magnificent job in fundraising—the initial appeal raised about US$200,000, which has been used for part of the launch fee (see details later). The ARRL's second campaign has, together with other donations, produced more than US$305,000. The German government has put up about US$600,000 aimed at supporting just one aspect of Phase-3d technology called LEILA. The RSGB in the UK donated US$35,000 to AMSAT-UK, with an offer of the same amount if AMSAT-UK can match it. AMSAT-UK have already funded the 2 m transponder construction (US$21,000) and made other payments for batteries (US$100,000), support for the launch fee (US$40,000), and other expenses to the tune of about US$180,000 over the past four years. Surrey Satellite Technology at the University of Surrey is donating time and materials relating to the space qualification testing of the NiCd batteries to the value of US$25,000. And so the list goes on! So far the total raised is about US$2.5 million.

As impressive as it is, the amount raised provides only a proportion of the cost. ESA recently agreed on the launch fee, US$800,000 due at the end of 1995, US$200,000 due in 1996. Examples of some costs are: launch adaptor rings US$60,000; heat-pipes for temperature control US$48,000; space usable RF power relays for 2 m and 70 cm US$40,000; solar arrays US$138,000, Travelling Wave Tube Amplifier producing 60 W at 10 GHz for X-Band Transmitter US$8,000; and Main Flight Battery US$40,000. Many of these prices are substantially below market prices, and in the case of the last three items supplied by Dornier of Germany, the discount was a significant donation to Phase-3D.

The current estimate of funds still required exceeds US$500,000 from the worldwide AMSAT fraternity, which incidentally has just been joined by AMSAT—France, with donations of two L-Band backfire antenna reflectors in response to the recent request for assistance, and donations of over US$7,000 to AMSAT-NA. Due to the uncertainty of launch vehicle, the pre-launch period at Arianespace's facility at Kourou could be a lengthy one and the costs of this are unknown. Also currently no funds have been available to pay for launch insurance cover.

So that is the situation as it stands as of April 1996. For updates on progress on construction , pre-launch preparation and the launch campaign itself, see the "Satellite Column" each month in *Break-In*. If you have a particular query please do not hesitate to contact me either by mail or via the Packet network at ZL1AB BBS. *βi*



THE QSL BUREAU

with
BARRY STEWART
ZL2RR

THE last month or two has been a very slow time at the QSL Bureau. Both inward and outward QSL card tallies are quite low, so do not expect big mailing from the district Sub-Bureaux arriving at your QTH (ZL8RI excepted, of course!).

The Venezuela (YV) Bureau stamps the receive date on all QSL cards that they get from their members. A small parcel was received from YV-land just prior to the NZART Conference and some of the cards contained therein had receive dates as far back as April 1994. You can now rest assured that the delay wasn't at the ZL-end of the operation!

A recently received letter from the Radio Amateur Association of Crete states that it "... has been very difficult to QSL with us through the QSL Bureau of the Amateur Radio Association of Greece." The upshot of this is that the RAAC now has organized a local QSL Bureau and last January started to handle QSL cards for SV9. Their mailing address is: Radio Amateur Association of Crete (QSL Bureau), PO Box 1390, GR 71110 Iraklion, Crete, Greece.

Unfortunately the running costs of the QSL Bureau have escalated dramatically in the last few weeks. A recent call from the Post Office drew my attention to the fact that both the local mail-room and myself (as "Bureau Manager") have been working with an outdated schedule of postage charges. The result of this discussion is that the Bureau costs will double! The old three-world postal zones have been increased to five and the basic surface-mail letter has disappeared. In their place are now five mailing zones and an Economy Post International ("an inexpensive service when time isn't critical") mail basic letter rate. Like the old surface mail letter, the maximum weight is still 200 g **but** the maximum thickness is reduced to 10 mm from the old 20 mm standard! Only two zones (C and D) offer a surface mail service. A 10 g letter thicker than the allowed 10 mm Economy Mail specification goes as a "small parcel" surface mail package for $1.80 as against $0.80 Economy! The maximum 2 kg "Small Parcel" postal rates are, in most cases, more expensive than dispatching 20×10 mm×100 g envelopes overseas! The faster turn-around of our members outward cards under this new postal regime is a bonus—but it is at a cost that we cannot avoid.

In the near future I hope to print a list of ZL1 call-signs that have cards awaiting them at the ZL1 QSL Sub-Bureau. No doubt quite a number are for Silent Keys or wrongly copied or deleted call-signs. The non-availability of up-dated call-sign lists makes life more difficult for the Bureau volunteers. If you do not want to collect QSL cards from the Bureau, I would ask kindly that you write to your appropriate Sub-Bureau and inform the manager; none of us like dumping cards in the wastepaper bin unless told to!

Are you making use of computer-generated labels on your QSL cards? No problem! But a plea from my aging eyes. Please change the ribbons **before** the print gets too faint. Lash out and make your card sorters happy-chappies. Thank you!

73 til next time

SILENT KEYS

The Association deeply regrets to record the death of the following members and extends its sincere sympathy to the bereaved

Ronald (Ron) NUGENT (G2FTS) ZL2APW

It is with regret that we record the passing of Ron in Blenheim on May 22, 1996 after a lengthy battle with ill-health in his 74th year. Born in Herstmonceux, England, and retired to Blenheim in 1987.

Ron obtained his first Amateur Radio licence before World War II, where he served in the RAF for the duration.

Ron retired from his work of radio and TV technician and settled in Blenheim nine years ago and was soon to set up a very top-class ham radio station with quality equipment and an "aerial farm" of Cubical Quad, Rhombic, Sloper and Loop antennas. He had many regular DX skeds, in particular to the USA and the UK which he was able to maintain almost on a daily basis.

Ron was a real fighter of that darned ill-health problem he had and knew he would have to bow to it one day, but with his cheerful voice and little chuckle through the conversation of a QSO—little did he let on what he was really going through. Ron has put the microphone down for the last time and his voice will be sadly missed from the radio waves both here in ZL and around the world. From his "radio friends" here in ZL and overseas, we wish to extend to his family, Maureen his wife, Ian his son, daughter Valerie and her husband Tony and their families, our very deepest sympathy of a true friend and gentleman.

Tarry Martin ZL2KV

John Austin PORTER, FCA, G3AQY

Austin Porter, who died on February 8, was one of a rare breed of radio amateurs who combined a love of radio construction with a passionate love for languages. He registered with the RSGB as a receiving station when he was a schoolboy in the early 1930s and upon the outbreak of World War II he immediately volunteered for duty in the Royal Signals. He was engaged for most of the War years intercepting enemy Morse transmissions, which were then decoded at Bletchley Park. During this time he taught himself Maori with such success that he was appointed an external examiner by the University of London, but by profession he was an accountant. Upon the cessation of hostilities, he was granted his transmitting licence, and, as was usual in those days, he built most of his own equipment. But this time he was proficient in at least six languages and was able to converse fluently with radio matters all over the world. This led to lifelong friendships in many different lands.

Nevertheless, it was not until this last decade that he was able to talk in Maori to a fellow ham. It transpired that very few of the New Zealand amateurs were fluent in Maori, but ultimately he made contact with Courtney Edgecomb ZL2AQZ, a New Zealander of European stock who actually taught Maori. Thereafter the Maori tongue could be heard on the 20 m band nearly every Monday morning and the Maori community fêted him in a suitable ceremony at Rotorua. Kia Ora Austin, you will be sadly missed the world over, from G land to ZL.

G2AJV

MAGAZINE SURVEY

Communications Quarterly

Winter 1996

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p. 23 Try NMR with your Old CW Rig.
p. 57 Simple and Inexpensive High-Efficiency Power Amplifier.
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QST

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The Future of the Amateur Service Committee

(FASC)

by A. G. GODFREY ZL1HV

AS you should all know by now an IARU Committee has asked all amateurs for their views on the future of amateur radio. We (NZART) will represent the views of the ZLs. To assist the preparation of a paper representing our views copies of the FASC paper have been made available to all branches. It is hoped that you will all give this some thought and make your views known.

To assist you here is a list of points to ponder.

The provisional agenda for WRC-99 says "consideration of Article S25 concerning the Amateur and Amateur Satellite Services". That is tantamount to saying those services are being reviewed by the ITU.

Because of the three year cycles of IARU Regional conferences there is an element of urgency in getting at least a first draft completed within the next two months. The time scale is: 1996 IARU Region I, 1997 IARU Region III, 1998 IARU Region II, 1999 (2001) World Radio Conference (2014 (2016) latest possible date for implementation. The figures in brackets represent alternative years. The implementation dates are based on the worst case of implementation of ITU changes. They are included to show that any changes will not be made tomorrow; nor will they be made this century.

Therefore it is necessary that you gaze deeply into your crystal balls and let your space fiction ideas run riot. What will the communications scene be like in 15 years hence? Morse and HF is but one item to be considered. Others are: third party traffic; banned country list; change of definition of the Amateur Service; operational and technical qualifications; transmitter power; quality of emissions; station identification; international licences; shared bands; keeping the Satellite Service separate; incorporation by reference; emergency communications; definition of plain language.

I have been given the job of drafting the ZL response to the FASC request. To do this I need your ideas as soon as possible. I can be reached by Packet radio @ZL1AB, by Email at jumbo@kebbs.gen.nz and by snail mail at 882 East Coast Road, Browns Bay, North Shore 1310. NO telephone calls please. I do not have the time to write down your dictation! The Gensec will also be pleased to accept your offerings.

The draft will go to the IARU Liaison Committee for scrutiny and modification, and from them to NZART Council for their approval before it is released.

Away you go and put fingers to keys or pen to paper. Here is your chance to have some input to our future. Don't miss it!

73 de ZL1HV

Capital Conference 96

A BIG THANKS to everyone who helped make Capital Conference 96, over Queen's Birthday Weekend, a huge success—to those who attended, to those who agreed to join me in making it happen, to those business people who supported us, to everyone at the Victoria University of Wellington Student Union Conference and Seminar Centre … I am deeply grateful for your support.

It was at New Plymouth two years ago that Branch 50 Wellington volunteered on the spur of the moment to run this conference … and it was quickly clear that it would need to be a regional effort. My thanks to the other clubs—Branch 18 Hutt Valley, Branch 63 Upper Hutt, Branch 42 Titahi Bay and Branch 74 VHF Group—for their support, and to the many individuals who stuck by me as we debated what it would be nice to do and what our resources would let us do, and who turned out over a cold and damp weekend to make Conference work—and paid their own way in doing so.

I know it did work; the level of animated discussion at meal times was evidence of that. Forums were packed, the alternative programme was an interesting mixture, and the evening entertainment should have satisfied a large range of tastes.

Formal business—NZART's annual meeting and the several sessions on AREC—was well attended, as were the forums. The mobile rally found no customers, however. Bumper-bar verticals may have had their day.

Keep those ZL6CC award requests coming in. In the year that the call-sign was active more than 1500 contacts were made. I understand DXCC was achieved … no doubt the details will appear in *Break-In*'s Awards column in due course.

For the record: on the Saturday, 162 had morning tea (including partners going off on the alternative programme), 154 had lunch, 152 had afternoon tea and 167 booked for dinner. On the Sunday there was 158 each for morning tea, lunch and afternoon tea, and 152 for dinner. We calculated break-even point at 180—the average of the previous five NZART Conferences according to information supplied by Headquarters. Hard work by the raffles team should have coped with the potential shortfall. More than 200 people registered, many for just part of the weekend.

For now, please accept this as a personal thanks to all those involved. I have avoided naming names because it would be terribly unfair to inadvertently miss out someone who played a small but vital role.

Doug McNeill ZL2AOV
Convenor Capital Conference 96

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Radio Communication

May 1996

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p. 68 TECHNICAL TOPICS: Mast Head Pre-Amp for 137/144 MHz, Cohn Minimum Loss Filter, Clothes Peg 450 Ohm Open Wire Spreader
Down to Earth: p. 34 Receiver Antenna Tuning Unit

DX-ING

with
RON WILLS
ZL2TT

DX News

ZD8 ASCENSION ISLAND. Des G0DEZ is active from Ascension Island—IOTA AF 003—until the end of 1996 with the call ZD8DEZ. Activity will be concentrated on HF and 50 MHz, mostly CW, but also with a little RTTY and SSB. There will be some QRP activity around the recognized QRP frequencies.

Equipment is as follows: IC-706, 5-el monobander, 50 MHz; TS-850, Sat rotary dipole 28, 21, 14, 7 MHz, Butternut HF9V 1.8 to 50 MHz including WARC.

Times of operation are not known due to the unpredictable nature of Des's shift-work. However, he intends to be active in all major contests for the remainder of 1996. QSLs should be via bureau to G0DEZ or direct to *Call Book* address. Please, no QSL cards to be sent to Ascension Island.

V5 NAMIBIA. Charlie KY0A will sign V5/ZS6SYG during July and August. He will operate mostly mobile from northern Namibia running 500 W from his van. QSL only via KY0A. No cards to the ZS Bureau, please.

JX JAN MAYEN. JX7DFA will be active from Jan Mayen until October.

OX GREENLAND. From July 10 to August 25, Terry G3WUX will be active (5 W QRP) from Greenland as OX/G3WUX/P in CW (14.002 MHz) and SSB (14.200 MHz). QSL via home call.

VK0 MACQUARRIE ISLAND. Warren VK0WH usually can be found only on Monday, Tuesday or Thursday, operating 40 m. Check around 7009 kHz between 1000 and 1100z for Warren and he usually listens up 3 kHz. Also, he does sometimes show up on 14260 kHz (or 14038) with his QSL Manager. He is reported to be there until December of 1996. QSL via VK9NS.

9N NEPAL. 9N1KY should remain active until sometime in July.

D6 COMOROS. DL4XS, DL6ET and DL3KDV plan an all-band effort including 160 m from August 22 to September 4.

JD1 MINAMI TORISHIMA. JG8NQJ/JD1 will return there for a three month stay starting July 15. QSL via JA8CJY.

SPRATLY ISLANDS. Jaan SM0EK currently active as 9M2JJ in Malaysia, is thinking about going to Paulau Layang Layang (which is one of the islands in the Spratleys). Planning is in the early stages and Jaan is soliciting help from local hams in Malaysia and anyone that can provide information to get this DXpedition afoot. Jaan can be contacted via Internet: sm0oek@pc.jaring.my

IOTA—Islands on the air

The "Island Hopper" DX Bulletin

Terry W9JOO informs OPDX that he and Art N2AU has started a new bulletin which is published 26 times a year. Terry has provided the following statement: "Like to work islands? We will keep you informed on what is the latest happenings in the world of island hunting; upcoming DXpeditions; how to get that QSL; articles on island operations; results of contests and special coverage of the US Islands Program. There is 78 years of ham experience between N2AU and W9JOO. Both are DXers and Contesters. Terry is on the Honor Roll with 321. Art publishes INSIDE DX and has many sources of info. We will also credit you with info sent to us and use it in ISLAND HOPPER." For a sample copy: SASE to Terry Long, 1385 Haupstrasse, Berne, IN 46711-1710.

ZL2HU.

ZL8RI Kermadec DX Association

Well it's now all over bar the completion of QSLing for the ZL8RI team. The operation was an outstanding success with just on 34,000 QSOs being made on all bands and modes. Those of you at NZART Conference 1996 will have seen the presentation from the ZL8RI team and got a better appreciation of what it takes to mount a DXpedition of this magnitude. The team have now recovered from the trip and their seasickness, well some of them, and as a result are now planning the next DXpedition. At the moment it's tentative, but it looks like a visit to ZL9, most likely with the call ZL9CI or ZL9AI in January 1999. By that time ZL9 should be very high on the most wanted country list again.

If your club wants a guest speaker on the ZL8 DXpedition feel free to contact any of the team, ZL2HU, ZL2AL, ZL2DX, ZL3GQ or ZL2TT. We are happy to share our experiences, subject of course to being in your area at the time. Feel free to contact me, Ron ZL2TT, I am happy to try and co-ordinate such presentations.

New HF Beacon

The 4X6TU beacon is now operational from Tel Aviv on 14100, 18110, 21150, 24930 and 28200 kHz with transmissions lasting 10 seconds every three minutes on each frequency in turn. Stepped power (maximum 100 W) to vertical. 4X6TU joins ZS6DN, LU4AA, YV5B on these frequencies and with the same transmission pattern.

DX Shack visit

This month's shack visit is to a former ZL novice who was to my knowledge probably the first and only novice to have obtained DXCC, while still the holder of an N call. It was to Ken Holdom ZL2NBK, better known these days as Ken ZL2HU, leader of the recent highly successful ZL8RI DXpedition to the Kermadec Islands. Also well-known for his own one-man DXpedition to Pukapuka in the Northern Cook Islands where he operated as ZK1KH, a call he still holds.

Ken first got his licence in April 1989, as ZL2NBK. He had seen ham radio many years before in his home town of Clyde in Central Otago where he was born, bred and educated. It was in the early 1960s that Ken visited the late Jim ZL4KE in Clyde. He always remembered the big shack and the old valve equipment in rack and panels in the radio room. However, it was not until one day in early 1988 when he went to Palmerston North to visit some Cook Island friends that his interest in radio was rekindled. He happened to visit Bob Walker ZL2BNB although he did not know he was a ham when he first met him. He showed Ken the shack and demonstrated what you could actually do on air. Ken was impressed and said "I want one of those." The sitting of the ham licence, the need for Morse code, etc, were all explained to Ken. Ken, being a single-minded and focussed individual, knew what he wanted and set out with his usual determination to get it. First of all he purchased a Yaesu FT757 GX2, his first rig and still the main rig in the shack. Then he got some books about amateur radio and the material needed to pass the amateur examination.

He studied at home, and although it took him a couple of tries, within less than 12 months Ken passed his licence and obtained the call ZL2NBK. In those days conditions were good on HF and although limited in frequencies as a novice he was soon chasing DX and became a keen member of the 10/10 club.

Right from the start Ken was interested in chasing DX so he focussed on obtaining DXCC as a novice. He finally accomplished this with the award of his DXCC in March 1992. Ken's DXCC total at the moment stands at 180 worked and about 150 confirmed. He still uses much the same gear, although now he also has a TH5DX antenna, an FL-2100B, plus a VHF 2 m Icom IC-2E for Packet and a Kenwood TM-401 for 70 cm. He also has a TS-430 as a spare rig.

Ken has never worked in the electronic or engineering fields, since he is a "dyed in the wool" public servant. After leaving school he joined the Ministry of Works in Alexandra and was involved with the construction of the Clyde Dam. Then moved on to the Marine Department in Wellington before taking up a position in the Customs Department. It was then that the wanderlust caught Ken and he accepted a job in the Treasury Department in Rarotonga in the Cook Islands. Ken spent two years In Rarotonga and not only did he recover a lot of debts but he also met and married his wife Imela (Emily) who is a Cook Islander who originally came from Pukapuka—an island in the Northern Cook group.

After his two years in the tropics Ken returned to ZL with his new XYL and moved to his current QTH in Tawa. He rejoined the Customs Department where he has been working for the last 22 years at Head Office. Ken is now 46 years of age and very proud of his XYL Emily, the women's tennis champion of Pukapuka, and their two year old son William.

Prior to taking up ham radio Ken was very interested in tropical fish and was into breeding them in a big way. Now the only fish he comes in contact with are those he eats. However, he still has other hobbies such as collecting stamps and coins. He is also a specialist book collector. He collects books on the Cook Islands and has one of the best Cook Island collections that exists anywhere. Having met Ken's mother, who still lives in Clyde, I discovered where he got his collecting bug, it certainly was from her. She collects pens and has 1000s of them lining the walls of her house.

Another hobby that makes Ken very popular is his interest in home brewing. No, not amateur radio home brewing, but beer. And as a regular visitor to Ken's shack I can confirm he is an excellent brewer. Ken says any homebrew enthusiasts passing are welcome to call in for a taste of the latest ZL2HU brew.

Ken's interest in DXing first started when he went back to Rarotonga in 1991/92 on holiday and got the call-sign ZK1KH which he still maintains. He then went to Pukapuka for one month in 1994/95 and took the FT757 and two G5RV antennas. He had 1,616 QSOs over the period. Full details of his trip may be found in *Break-In* September and October 1995 issues.

These days Ken is really well-known for leading the recent ZL8RI DXpedition to the Kermadec Islands. Full details of this trip have been written up by Lee ZL2AL, a member of the ZL8RI team, and is featured in this *Break-In*. Ken had to write over 200 letters before he got permission for the group's visit to ZL8 so he certainly shows his determined streak by having seen this whole thing through. He is now starting on the next DXpedition which will be planning a visit to ZL9 in January 1999.

Ken is keen on travelling and already has visited VK, KH6, 9V1, 9M2, HS, YB, HL and 3D2 but I think it would be true to say that one of his favourite countries would be Japan. He visited Japan along with XYL Emily in 1993 and spent a month visiting hams. During the trip he visited the Nagara antenna factory. He also visited a number of ham clubs and, of course, met many JA hams, some he had worked and many he had not. This relationship was to pay off when he decided to plan the DX pedition to ZL8. The Japanese contacts really came to the party and Nagara Antennas provided two of their three-band antennas for use by the group.

Ken has a regular weekly sked with his friend Kaz JA3BQE. They have maintained contact for the last 4–5 years on either 15 or 20 SSB. It was Kaz who initially came up with the idea of the ZL8 trip and when he was unable to come himself suggested Bin JA3EMU.

The ZL8 DXpedition has taken up a lot of Ken's time over the last couple of years but he has now decided that, after the completion of the ZL8 QSLing, he intends to work for the JCC and JCG awards and also to aim for the DXCC Honor Roll. Ken is very keen on awards. He used to be a keen ZL County hunter and plans to get all 112 the hard way. To Ken the hard way means getting a QSL card from a station in each county even though it's not necessary for the award itself. Ken's walls are plastered with awards, especially the Blossom Festival one and he has got one every year since he got his licence. Plus also 10/10 awards and his DXCC.

Family life is very important to Ken now and he intends to spend more time with Emily and two-year-old William before he goes off to ZL9.

World Wide WebCluster

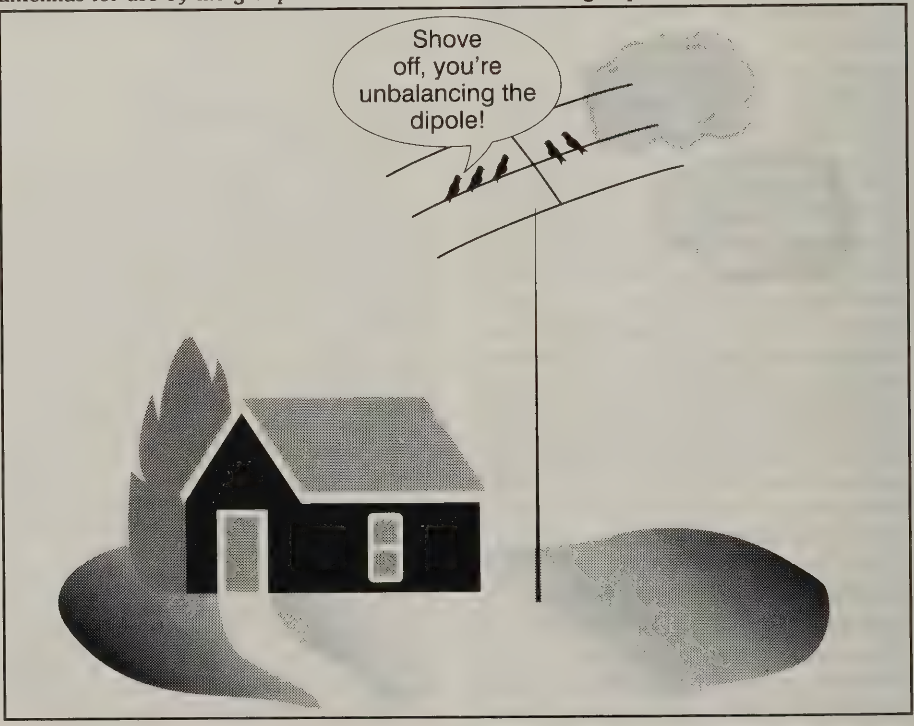
The 59(9) DXReport now has a web site. The URL is:
`http://members.aol.com/the599rpt/dx.htm`

QSL via

ET3NT via Box 6128, Addis Ababa, Ethiopia. D68GA via N6ZV, ZL8RI via ZL2HU.

You are encouraged to contact me via telephone (04) 477-2484, mail to 163/Mark Avenue, Grenada Village, Wellington. Packet ZL2TT@ZL2WA. Email rewills@actrix.gen.nz

Thanks to RSGB *DX News Sheet, QRZ DX*, ARRL/*QST*, OPDX/*BARF80*, and the ZL DX discussion group.


Shove off, you're unbalancing the dipole!

The MORSEMAN

by
GARY BOLD
ZL1AN

Straight-key comments

BILL ZL2AVL wrote as follows:

"I re-read your straight-key article in the November 1995 *Break-In*, and it revived my interest in trying to promote a ZL version of the ARRL 'straight-key night' activity. If those interested in starting such an activity could write to me at the Call Book address, I'll collate the comments and present it to the NZART Contest Manager for action. I think having an 'activity' rather than a 'contest', though, is best."

A fine idea. Comments to Bill? He goes on:

"When we did our Morse training in the Navy, eons ago, every morning our instructor made us stand for a few minutes, arms hanging loosely, and giving the hands and wrists a good shake. This certainly loosened them up!"

I haven't heard of other Morse teachers advocating this, but it's certainly a good idea. One of the problems I often see as a Morse tester, is that when applicants sit down and grasps the key for the sending test, their first attempts are usually pretty jittery—even when they are using their own key, with which they have practised. After the stress of writing the receiving test, their fingers and arms have become tense and tight. If this happens, I tell them to send some practice material and wander off for a few minutes so that they can tune their arms up without the menacing presence of the Testing Officer.

When I come back the Morse has usually improved markedly. In future, I'll advocate a preliminary wrist-shaking session.

This is true for keyer sending too. I know that if I sit down at the paddle cold, it takes a few minutes for my sending error rate to drop to what I consider acceptable. If I rip off a couple of "quick brown fox" sentences, offline, and run through the numbers forwards and backwards first, my QSO goes much better.

Bill also sent a copy of a 1948 *NZ Freelance* article about copying traffic on teleprinters at ZLW, and another from the 11th edition, 1948, of the ARRL *Hints and Kinks* manual, concerning adjusting a bug. If you'd like a copy of any of this material, let me know.

Notch filters

Conditions on 80 m have been bad recently. This has prompted several queries about filters, including this one: "I don't have a narrow filter for CW, and I often have difficulty copying when another station starts sending a few hundred Hertz from the one I'm listening to. An expert said I needed a 'notch filter'. What are these, and can you give me a typical circuit?"

Yep. And a few general comments about conventional filters as well, to answer questions from others.

Firstly, if you are keen on CW but have an older rig with no CW filter, think seriously about either building or buying an audio one. Two commercial filters I've reviewed and thoroughly recommend are the MFJ 752C "Signal Enhancer" and the MFJ 784B DSP filter. These cost $240 and $500 respectively from Barry, the local MFJ agent (see address in the last column) and were reviewed, respectively, in the April 1994 and September 1995 columns.

If you are into simple construction, and don't have that many spare cabbages, think seriously about building the homebrew bandpass model I use myself every night and which uses the MF8 switched-capacitor filter chip, driving a TDA 7052 audio amplifier module. There's a schematic in the August 1993 "Morseman" column. This has selectable 3 dB bandwidths of about 155 Hz and 45 Hz, because when I want a filter, I want a *narrow* one.

The 752C has a selectable, tunable notch filter, but my homebrew model doesn't. I'm not sure about the 784BT. I've built and used several notch filters in the past, but currently don't have one operating.

A notch filter is a sort of "anti-filter". Instead of *enhancing* signals, it *suppresses* them. It's normally tunable within the audio passband, and allows you to zap, "null", or "notch out" unwanted carriers or CW signals on an adjacent frequency. In its simplest form, it nulls only a single frequency, so doesn't work so well on interfering SSB or AM signals, which have sidebands. Still, it often helps.

The classical configuration works by combining high-pass and low-pass filtered versions of the unwanted signal. At one particular frequency, these versions will have exactly equal amplitude but opposite phases, and will cancel. Figure 1 shows a design I've used, which can be built with a quad op-amp chip such as the LM324, here biased to run from a single 12 V supply. I first saw a version of this circuit used in the excellent 1978 ATLAS 350-XL transceiver.

The two ganged variable resistors labelled "6R", called "ganged notch frequency adjust" set the notch frequency. If they are constructed with a 100 kΩ fixed resistor in series with a 500 kΩ potentiometer, the notch will tune from about 270 Hz to 1600 Hz. The notch is at least 30 dB deep (it can never be *infinitely* deep because real operational amplifiers are not completely ideal, and will never give *exactly* anti-phase signals to combine).

The sharpness or selectivity of the notch can be adjusted by the 1 MΩ pot labelled "notch sharpness adjust". At maximum resistance, sharpness is also maximum.

My original measurements on this filter have long since vanished in the morass of paper in the basement, so I set up a PSPICE simulation to check it out. Aside: PSPICE (PC version of SPICE) is a computer program for evaluating a circuit's behaviour *before* you build it, developed and sold by MicroSIm Corporation. My son Mike, who works as a scientist/design engineer in an R and D Lab, finds it invaluable. It's considerably less embarrassing to find circuit goofs at the design stage rather than when all the parts are on the PCB. Op-amps are simulated using models that closely replicate their non-linear and frequency-dependent behaviour. We've found that PSPICE modelling of simple circuits like this is very accurate. MicroSim also have a highly commendable policy of distributing a freeware, evaluation version, which they *encourage* you to give away to others!

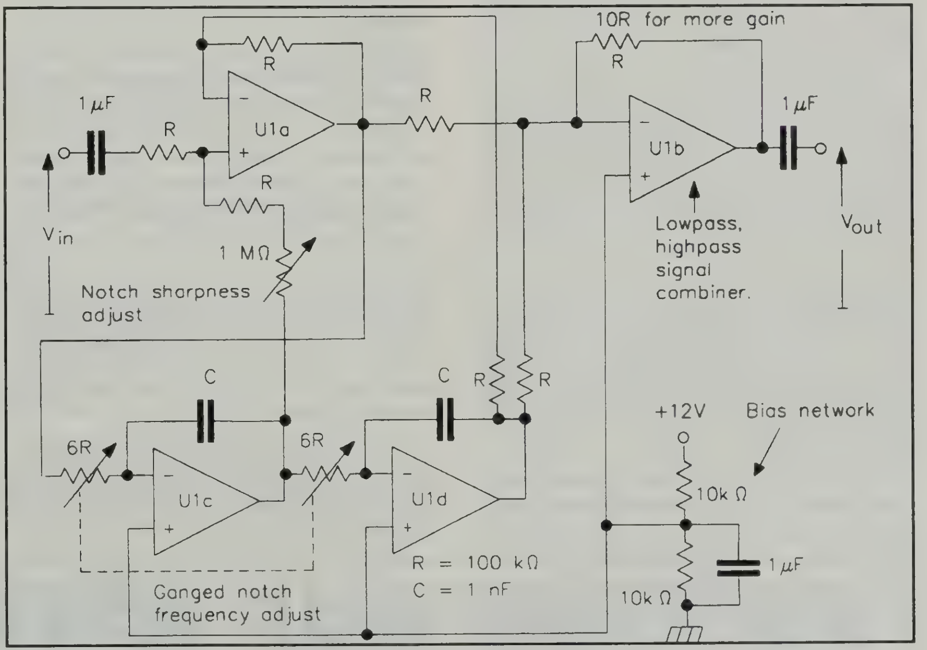


Figure 1. CW Notch Filter Circuit.

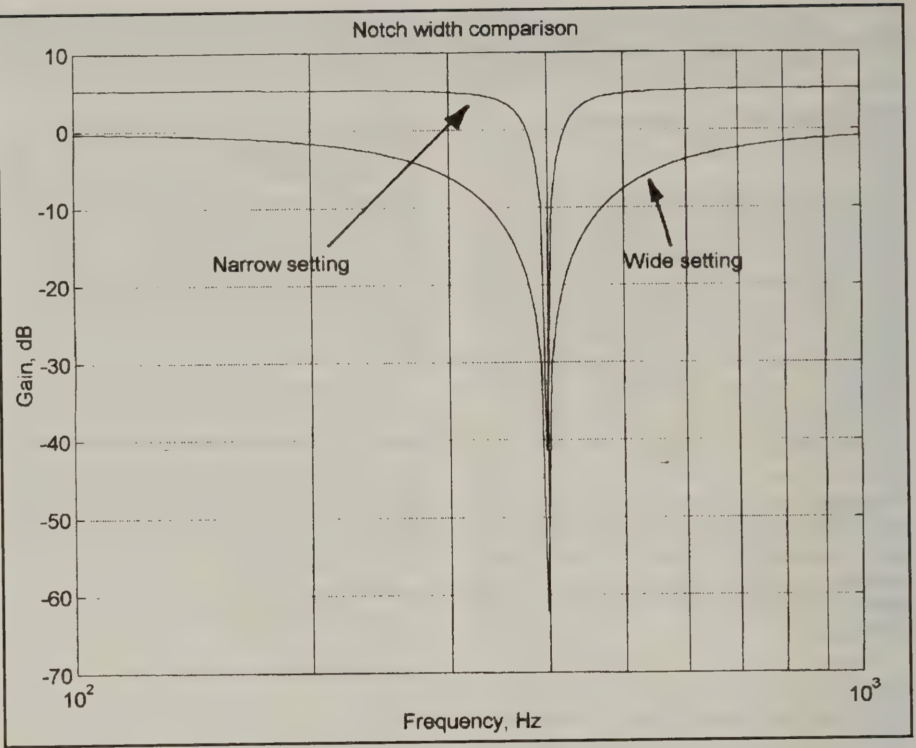


Figure 2. Notch Filter response.

Hence, I distribute the 1990 DOS evaluation version to students in my Network classes. If you'd like it too, send me a 1.2 or 1.44 Mb disk. Unless you're already familiar with SPICE, you'll also need the manual Sze Tan and I produced to go with it, because we wrote a menu-driven front end to simplify the very picky, user-unfriendly data file that SPICE traditionally requires. The software is free, but the manual will cost you eight cabbages. Be prepared to spend some time learning to drive it.

For brave, up-market web surfers, the latest WIN95 shareware version can be downloaded from
`http://www;microsim.com.download.html`
Be warned, it's about 12 Mb, and assumes basic SPICE literacy. However, with this version, you *draw* the schematic of the circuit to be simulated, instead of composing a descriptive text file, and you can send this, plus all the output plots you make, to a printer. It's much whizzier.

The evaluation versions contain *all* of the features of the current production versions, but are limited to relatively small circuits. Unfortunately, the simulation I did here was too big to run on either evaluation version.

Back to the notch filter. The simulation shows that when the "frequency adjust" resistors are 400 kΩ, the notch frequency is 400 Hz, as predicted. At minimum sharpness, the notch is 130 Hz wide between the 3 dB frequencies, dropping to 74 Hz at maximum sharpness. The overall gain away from the notch is 0 dB and 5 dB at minimum and maximum sharpness, respectively., but you can increase this by changing the feedback resistor in the last, combiner stage, as shown in the schematic. Figure 2 shows the filter response at minimum and maximum sharpness settings, when tuned to 400 Hz.

This filter can be inserted in series with any other audio filter you may have, or used standalone if followed by a simple one chip audio module (such as the LM380 or TDA 7052) to drive a speaker.

For a more versatile unit, with very little extra effort, you can pick off traditional high-pass, band-pass and low-pass responses from the outputs of op-amps U1a, U1c and U1d, respectively. But each of these configurations gives only a two-pole response. If you just want a simple band-pass design, by MF8 filter, giving four poles (steeper skirts) and an optimally flat (Butterworth) pass-band, is better still.

However, even with a good notch filter tuned to an interfering CW signal, you'll often hear transient clicks on the leading and trailing edges of the elements—especially if the interfering signal is strong. This is because starting or stopping any sinewave generates sidebands around the sinewave frequency, which are above and below the null, and hence come through the audio.

Optocoupler Schematic error

In the April 1992 column I described a COMMODORE-64 keying interface using a 4N28 optocoupler, but with the pin numbers scrambled on the schematic. The diode anode and cathode should be pins 1 and 2 respectively, and phototransistor collector and emitter, pins 5 and 4. Dick ZL2ADB queried this recently. I thought I'd published a correction, but maybe I didn't. Anyway, corrections are easy to miss. If any of my circuits look daft, check with me.

I described a better interface for MS-DOS computers, keyers or keyboards using a higher voltage SFH601 optocoupler in the September 1994 column. This needs a 1.5 V cell, but is bombproof.

Computerized Morse testing is approved!

Fred ZL2AMJ, the NZART Administration Liaison Officer, has notified me that on the basis of my successful trial of computer-aided Morse testing, such testing has now been approved by the MoC for use on a country-wide basis. This is great news! As soon as the Administrative procedures have been put in place, this will become an *option* available to all Branches. I'll let you know the details as soon as I get them.

Life in a beehive*

Once upon a time a group of worker bees (radio amateurs) decided to join together to form a hive (radio club) with the object of providing a common meeting place for the mutual benefit of all who wished to share a common interest.

The hive prospered, membership grew, soon it was time to seek out a permanent home. The worker bees toiled long and hard for a couple of tiring years, happily giving of their time to create a magnificent beehive (clubrooms). The worker bees continued their efforts and the hive went from strength to strength … UNTIL:

As always happens in a beehive community some drones appeared. These drones set out to upset all the good work that had been done by the worker bees … BUT:

In the beehive lurked a Queen Bee who had no hesitation in sorting out all the drones in the hive. After she had completed this necessary task, the hive once again returned to its normal happy state and all the remaining bees lived happily ever after …

Maybe we mere mortals have something to learn from the humble bees?

Reprinted from Papakura Radio Club Inc Newsletter

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*Not Parliament.

SUPPORT OUR ADVERTISERS!

CONTESTS

with
JOHN LITTEN
ZL1AAS

Calendar of Events

July 6	**MEMORIAL CONTEST**	August 3	West Australian 80 m CW Contest
July 6	Australian 80 m CW Sprint (VK)	August 3	**VHF MAIDENHEAD SPRINT**
July 13	Australian 80 m Phone Sprint	August 3	10×10 QSO Party 28 MHz SSB
July 13–14	IARU HF World Championship	August 17–18	Keymen's Club of Japan Contest
July 20	**SOUTH PACIFIC 160 m CONTEST**	August 17–18	SEANET DX SSB Contest
July 20–21	SEANET DX CW Contest	September 7	**NOSTALGIA NIGHT CONTEST**
July 27	**WAITAKERE PHONE SPRINT**	September 7–8	All Asian Contest
July 27	West Australian 80 m SSB Contest	October 5–6	**VK-ZL-OCEANIA DX SSB CONTEST**
August 3	**WAITAKERE CW SPRINT**	October 12–13	**VK-ZL-OCEANIA DX CW CONTEST**

FOR further information on any of the above listed contests, please feel free to contact me. During my recent move to the new QTH, I believe that some mail has gone astray. If anyone has not yet received a reply when they expected one, I apologise. The best address to contact me on NZART matters is: Onemana Post, Whangamata, New Zealand. I may also be reached on Email: littenj @voyager.co.nz.

Waitakere Sprints 1996

The Western Suburbs Radio Club are pleased to announce that the Waitakere Phone Sprint will be held on Saturday, July 27, and the CW Sprint will be held on Saturday, August 3, 1996.

There are NO rule changes from last year.

The contests are of one hour duration on 80 m and are open to all licensed amateurs in ZL, VK and Oceania call areas.

Objects of the Sprints

The operator's basic goal in the sprints is to make as many contacts as possible, without duplication, during an hour of operation on a single band. Any contact with ZL, VK or Oceania stations on 80 m during the contest can be counted, but a station can be claimed only once.

Eligibility

The Waitakere Sprints are open to all licenced amateurs anywhere in ZL, VK or Oceania call areas. SWL logs will also be welcome.

Contest periods

Phone: 1000 to 1100 UTC on July 27, 1996.

CW: 1000 to 1100 UTC on August 3, 1996.

Frequencies

Phone frequencies between 3.550 to 3.700 may be used.

CW frequencies between 3.500 and 3.550 may be used.

Power

In fairness and consideration to others we request that NO LINEAR AMPLIFIERS be used in the contest.

Contest Call

CQ Sprint, CQ Test, or CQ Contest.

Exchanges

Minimum exchange for a valid contact will consist of a serial number, sent and received. The serial numbers must start at 001 and increment by one for each contact made.

NOTE: Time and signal reports are no longer required.

Awards

Certificates will be awarded to the overall winner and to the best score in each ZL call area, and to the best three scores from VK/ Oceania. Other certificates may be awarded at the discretion of the WSRC.

Special Award

To encourage contestants to enter both Sprints, we have decided to issue a special Certificate to the entrant with the highest combined score. The method of calculation will be: Phone points + CW points ×2.

All logs received will be considered for this award. To qualify for the multiplied points each log must contain a minimum of valid contacts, that is ten (10) for Phone and five (5) for CW.

Logs

A separate log must be submitted for each Sprint, and must be clearly marked Phone or CW.

Contest Logs must show for each contact: call-sign of station worked, serial number sent, serial number received.

SWL Logs must show both call-signs in the QSO and both serial numbers.

Logs may be sent by Packet radio, please use three columns only with no commas or other delimiters. Any logs received by Packet will be acknowledged by the same medium.

Logs are to be in the hands of the Contest Manager, Alex Learmond ZL1BVK, 14 Takapu Street, Henderson, Auckland 1208, or by Packet to ZL1BVK@ZL1AB no later than September 1, 1996.

Operator information

Each log must show the following details: mode, call-sign, name, address, operating area (ZL1, ZL2), total number of contacts claimed.

A declaration that the operator has abided by the rules and spirit of the contest.

Any entry which is clearly in violation of the rules or spirit of this contest, or which contains an excessive number of duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed), may be disqualified. The decision of the WSRC Inc. in respect of the interpretation of these rules, the granting of awards and disqualifications will be final, and no correspondence will be entered into.

Alex H. Learmond ZL1BVK
Contest Manager WSRC

Attention all Young Amateurs

Dean Jackson ZL1JJ is starting a Young Amateur Net. Dean is wondering if there is any interest for a net, probably in the weekend, once a week. It would probably be 20 to 30 minutes long. It's not just for younger amateurs, it's also for the older ones too.

If you are interested please contact Dean Jackson ZL1JJ via mail as soon as possible. Dean Jackson ZL1JJ, 1 Tahi Terrace, Glen Eden, Auckland 1007, or myself via Packet ZL1PAM@ZL1AB.

Please include the area you are in, capabilities (like if you can go on 2 m or 70 cm), your call-sign, name and licensed class.

We will update you with more information in the near future via *Break-In*, Packet and the Official Broadcast.

73
from Pamela Blackett ZL1PAM

Pressure at 10 GHz

At the top end of the spectrum VK amateurs stand to lose access to 150 MHz of their 10 GHz band. The DTI has already put it out to tender by wireless local loop service providers.

ZL1HV

LF SCENE

with
ANDREW CORNEY ZL2BBJ
and BOB VERNALL ZL2CA

THERE have been several local and overseas happenings with amateur radio and LF bands. Firstly some ZL information, then to overseas:

Recent happenings

Events from the second quarter of 1996 are: Phil ZL1PW has now worked two-way to all districts, with ZL2 being last, working ZL2CA by CW. Phil thinks his transmitter is lacking in drive to the final, and he is also getting some T8 reports for chirp on the emission, but good DX reports are achieved. Andrew ZL2BBJ has worked Alex ZL4IE two-way CW, which is the best DX so far for Alex, no doubt helped by Andrew's upgraded receiving system which uses a combination of frame loop and active whip, which is low noise and has steerable directivity. In comparison, Bob ZL2CA, who lives near Andrew and uses a "big wire" for transmitting and receiving, has so far had only readability 2 copy on ZL4IE, which is an indication of the advantage of Andrew's receiving system. Day time two-way SSB contacts have been worked between George ZL3PN and ZL2CA, and also between Dave ZL3JE and ZL2CA, with ZL2CA using split frequency operation to dodge power line carrier QRM. ZL2CA also had a two-way day time CW contact with Bruce ZL1WB. Nat ZL3VN has experimented with various frame receiving antennas, and shown that they can give a few dB better received S/N than using a "big wire". George ZL3PN has also built a frame receiving antenna and the directivity helps receive weak signals in the presence of localized power line carrier QRM. Dave ZL3FJ is modifying a commercial LF transmitter for linear operation and soon should have 500 W output. Dave ZL3JE had a failure in the high voltage supply to his transmitter, but that is now fixed and his 813s are still going well. ZL3JE is also trying a frame loop for receiving. Alex ZL4IE has upgraded his transmitter power supply to 900 V, and his pair of 807s are now being heard more often in Wellington. Kevin ZL4MD has modified a surplus LF transmitter for linear operation, and his 400 W output is regularly getting good DX reports. ZL2BBJ and ZL2CA are each working on similar design solid-state amplifiers, using 18 and 20 BU508A bipolar transistors respectively in push-pull linear output stages.

The LowFer environment in ZL

Amateur LF experimenters (or LowFers as they are known) are generally seeking to work DX as a test of their effectiveness. This is confirmed to be the main interest of ZL LowFers using the 165–190 kHz band, as reliable LF communication capability within the same region is now somewhat taken for granted. The ten or so regularly active ZL LowFers are spread from Northland to Otago, which overall is a separation of some 1100 km, and provides an opportunity for stations to try to work a range of shorter to relatively long paths. New stations are welcome, including receive only participation.

Practical amateur transmitting antennas are unavoidably very inefficient, and most of the transmitter power is soaked up by ground losses and incidental heat therapy for worms. However, even a few milliwatts of genuine radiated power can propagate by groundwave (surface wave) for relatively long distances. A few watts of transmitter power suitably loaded into an antenna similar in size to an 80 metre dipole should be able to be received by groundwave propagation at distances over a hundred kilometres away. Higher conductivity soil would be nice, but of course we have to accept that it is what it is. This includes seasonal variation between damp and dry soil. However, the geography of New Zealand gives opportunity for some paths to be mostly over seawater, and seawater has very high conductivity compared to soil. For example: Wellington-Christchurch (300 km) and Wellington-Dunedin (610 km) each have high percentage sea paths. Thus LF experiments in New Zealand may find more DX by groundwave (seawave) than would experimenters with inland QTHs in larger countries.

However, despite the possible ground wave opportunities in New Zealand, best LF DX is generally a result of favourable sky waves. The 615 km path between Wellington and Central Otago is mostly over land, for which LF signal reports are usually nil until after dark. These observations support the contention that for longer paths that are mostly over land, groundwaves are rather too lossy for the sort of power used by amateur stations and it is skywaves that "do the trick" (not unlike MF and HF). However, at LF there can also be skywaves during the day, particularly during winter, which is a different characteristic to MF. The simultaneous reception of a groundwave with one or more skywaves results in fading, but at LF the fading is slow (even very slow). Winter seems to be the best season for LF DX, with nighttime being better then daytime.

The ultimate limitation is being able to receive a weak amateur signal in the presence of a residual level of QRN (atmospheric noise or "static"). QRN is understood to originate mainly from lightning discharges within "elevated troughs" in certain weather patterns. Troughs well out to sea can bump up the levels of locally received QRN, even if local weather conditions appear to be fine and calm. It is unfortunate that some QRN has a coverage advantage of originating from a high altitude, whereas LowFers have ground level situations. However, there are thankfully times of relatively low QRN and good skywaves.

QRM from mains operated appliances shows up more on LF than on HF. QRM can easily be conducted around the neighbourhood by the mains wiring. Local QRM can make for frustrating conditions when trying to receive weak LF signals. Switch mode power supplies or any forms of "electronic chopper" are particularly nasty for being able to generate "hash" on the LF bands. Receiver noise blankers (such as first IF gating) can make a significant reduction in the impact of noise "spikes". Most LowFers carefully scrutinize the operation of electrical equipment within their household, for obvious reasons of seeking to minimize on-site QRM.

Most of the ZL LowFers who have persisted with trying to work the longer distances have eventually encountered a combination of conditions when propagation is good and overall noise is low enough at each QTH for two-way contacts to be made. CW is the most used mode, followed by SSB.

So far no LF reception reports of ZL amateur transmissions have been received from Australia. A few years back an Australian LF experiment in Victoria, using a large top-loaded mast, managed to get reports from parts of ZL. They were weak signals as heard in ZL. Thus indications are that it will not be easy for LowFer two-way contacts to be made across the Tasman Sea (about 2000 km wide), but time will tell on that.

LowFer station development in ZL

Most of the active ZL LowFers have worked at improving their radiated power level. While newcomers should not be discouraged from coming on and trying their equipment, the log books of regular participants show that stations with power output over a 100 W, along with use of dedicated LF antennas, are the ones who most frequently "cut the mustard" when it comes to receiving DX reports and making two-way contacts. When received signals are in the "very difficult copy" region then either a little more radiated power, or a little less local noise pickup, or both, can contribute to a station being workable or not.

There are practical limits on transmitting antenna size for most LowFers. There is not much that can be done about QRN levels. The main way of improving DX effectiveness is to increase transmitter power. The ZL regulatory limit of 5 watts EIRP is hardly at issue, as a typical transmitting antenna efficiency of 0.1 per cent would imply a maximum applied power of some 5 kW. ZL LowFers either have or are developing transmitters with output powers in the range of 50–1000 W. Higher powers of course have associated insulation and safety aspects to consider.

Low Frequency access for UK amateurs

The 165–190 kHz LF band able to be accessed by ZLs is otherwise unused in New Zealand. For 160–190 kHz, the allocation for the Oceania/Asia area (ITU Region 3) is to the fixed service, with aeronautical radionavigation secondary. In ITU Region 2 (the Amer-

DIGITAL MODES

with
STEVE DAVIS
ZL2UCX

WELCOME once again to the monthly rush to meet deadlines.

Conference has been and gone, I trust that all who attended had a great time. The weather was a bit cool, but the atmosphere of the Conference quite warm.

Conference

Two data sessions went very well. Alan Wallace ZL1AMW took a general session on data technology covering a number of different software packages. Use of a data projector allowed for an interesting presentation that was well attended. The Data Forum covered various aspects of networking and in particular some issues relating to frequency allocation, and other implications with higher speeds. As a result of the data forum there will be some dialogue with FMTAG to help establish some guidelines for data channel allocations, especially for 9600 bps operations, and some possible networking applications.

APRS

Firstly an apology for some gremlins that have sneaked in over past issues The correct details for the local APRS co-ordinator are:

Basil Davoren ZL2UT.

He can be contacted via Internet Email at bdavoren@voyager.com.nz.

Via Packet ZL2UT@ZL2GIS

or via mail at 22 Island Road, Gisborne.

It would appear that in the past I have misquoted Basil's call-sign, and even on one occasion called him by another name. Apologies to Basil, and anyone who has sent messages to the wrong destination. Contact Basil for current versions of APRS and for local registrations of DOS APRS. Also let Basil know if you have developed any local map files. The current version of APRS is v. 7.6, released for Dayton Hamvention. The Windows version of APRS was also released at Dayton as well, v. 1.00

JNOS

An "experimental" version of the next release of JNOS (v. 1.11x1) is now out. Again this is mostly bug fixes and minor improvements, but it was decided to make it a change of version to stimulate some more activity. The HTTP, FTP, Gopher server code has been completely updated to coincide with this new version of the base code. With this addition it is possible to make JNOS a pretty useful WWW Server from a low end DOS box. Wouldn't it be great to be able to access the NZART WWW Home Page via radio!

For those who have been using JNOS and have become frustrated with the limitations of DOS memory then there is a version for Linux. However, I have heard that many have made the change to TNOS on Linux, as JNOS for Linux has not had much development for a while. TNOS is also available for DOS but I have not compared them myself. Correct versions of the Linus kernel now have ZL.25 completely integrated, so there is not a great need for JNOS or TNOS for basic TCP/IP functions.

WWW

A reminder that the NZART WWW Home Page is at:

`http://www.nzart.org.nz.nzart`

NZART Council has created a new position for the post of WWW Page Editor. This is in line with a similar position for publicity of NZART via Teletext. I have taken on this role. More material is appearing from time to time, so please do drop in and let me know what you think. Also let me know if you have material suitable for placing on the Web, or if your Branch would like some details published there.

Developments

Some news from Basil ZL2UT in Gisborne indicates that there are some interesting things happening there.

The ZL2GIS BBS has been expanded to four ports. Port 1, VHF access with reverse forwarding from ZL2BQK in Hawkes Bay. Port 2, scanning PACTOR HF with forwarding from both ZL and VK stations. Port 3, 9600 bps ready for backbone linking on UHF. Port 4, experimental 2.2 Mbit QPSK downlink from a geostationary satellite. All running with the MSYS v. 1.19 software.

Also in the area is ZL2GIS-2 digipeater running with a KPC 9612 dual 1200/9600 bps TNC.

Great to hear that there are some keen developments going on somewhere.

Christchurch is also making some upgrades, with a 9600 bps channel for the BBS and a data repeater planned for the near future.

General

A very short one this month. Hopefully I will have a bit more time, and some more inspiration before the next deadline rolls around. As always I am still looking for some suggestions for material for this column. Some reports on what is happening in different parts of the country would be much appreciated, especially any where 9600 and higher speed or other interesting systems are being implemented.

Looking forward to hearing from you via:

Packet: ZL2UCX@ZL3AC
Internet: steve@zl2ucx.gen.nz
Post: PO Box 120, Christchurch

73, Steve

Continued from previous page

icas) the 165–190 kHz allocation is to the fixed service. However, the international allocation in ITU Region I (which includes Europe and Africa) is to broadcasting, and Europe makes extensive use of LF AM broadcasting in the band 148.5–255 kHz. Therefore any amateur access to LF needs to consider other parts of the band. Recently UK amateurs were granted access to the band 71.6–74.4 kHz, with a radiated power limit of 1 watt. This band has a keen following with cavers, who use communication by induction (rather than by radiation), for contact between portable transceivers. LF signals can satisfactorily penetrate rock and other ground conditions over the path lengths needed to support caving activities. Mike Bedford G4AEE is a representative of the Cave Radio and Electronics Group of the British Cave Research Association.

RSGB plans to publish a small book containing articles and information on the subject of LF radio experiments. The Editor of *Break-In* has given permission for RSGB to draw on material published in *Break-In*. RSGB are also looking for a design for a low frequency transmitter. Most ZL LowFers have built their stations by drawing on their junk boxes and/or modifying surplus equipment, so each one tends to have a different approach to getting "most bang for a buck". Most of the LowFers try SSB as well as CW, so there are limitations in developing a CW only transmitter design. HF/LF converters or transverters are another approach. Also many amateur HF transceivers now have general coverage receivers that include LF. Thus there are various ways of getting going on LF and is why there is considered to be no single way that is best to build an amateur LF station.

Other overseas LF developments

Correspondence by packet radio and Email has shown that there is interest from amateurs in Europe and North America in transmitting on LF. This will be further reported on in a future column.

A useful chip for LF transmitter drivers

The TDA7052A 8 pin DIL chip is intended for use in portable audio equipment, but also has been found to be useful as an LF transmitter driver. The rated upper 1 dB frequency response is 300 kHz, with maximum gain in the mid 30 dB range. Testing confirms that it can easily deliver 1 watt of output in the LF band, working from a 12 V supply. The "bridge tied load" configuration means that transformer coupling needs to be arranged, however transformer drive is suited to a solid state transmitter lineup that uses Class AB pushpull stages. The TDA7052A also has electronic gain control, which is amenable to implementing ALC. Note that the "non A" TDA7052 chip does not have the high frequency performance or the electronic gain control of the TDA7052A chip.

Bob Vernall ZL2CA

WARO NZ WOMEN AMATEUR RADIO OPERATORS

Callsign ZL6YL

with MARGARET McCONNACHIE ZL3UD

HI EVERYONE—Well I had a good time at Conference and I hope you all did too. It was nice to catch up with both new faces and old. The AGM went off well and the President's report is later on in this column. I took my car up, full of both people and things, and we stayed at my sister's in Brooklyn. Lovely to see the family again. But I am sure I came home with more things than I went up with!

I have no new members to report this month, so on to other things.

President's report

It is with mixed feelings that I write this report, my first as WARO President. I considered not standing this year but leaving it to others as we had two other nominations. I have had some problems this year which have caused me much trouble and made me feel very paranoid and also that I had lost my good standing in WARO. Having thought about it, I have decided that I will stand by what I've done in the past, I felt my decisions were right then and I haven't changed my mind. Apart from that it has been a good year. We haven't shaken the world with our doings, but, as always have been quietly working away in the background, shaping things as we want them.

Last WARO AGM had us investigating the possibility of extending the Thelma Souper Memorial Contest to include 2 m operators, etc. The report on this should have been in the December Bulletin but due to problems with the post, which have caused me a great deal of grief these past few months, it had to wait for the March edition. I hope we have been able to satisfy you on this subject. Unfortunately one or two other things got held up with the aforementioned postal problems which did nothing to enhance my reputation among WARO members. Fortunately most of the lost or delayed items have been returned or finally reached their correct destinations (I hope), that is all that I can remember. My only other beef about the situation is that if people are expecting something in the mail from me then, when it did not arrive, I would have expected a query from the people in question. That has not been happening until recently when I brought the problem to people's notice and as I am not a mind reader, I feel that I am taking much more flak than I deserve. This has made the last year very difficult to say the least. There was a problem at the beginning of our current year when the printer chosen by our new Bulletin editor did not make a good job. He was soon sorted out in fine fashion by Ann ZL3TNT and I would have loved to be a fly on the wall when she did the actual sorting! A letter accompanied the payment on that one and only account, outlining our disgust and concerns at the quality of the print and the price. That printer was dropped forthwith and another of much higher calibre employed. We no longer have this problem and the Bulletin is once again of the high standard that we have come to expect.

Also at Blenheim Jeanne ZL4JG sought our permission to apply for a "ZL6" call-sign, which was enthusiastically given. It was what had been asked for at the club's inception but things were stricter then and the ladies were turned down. This time, when Jeanne applied, ZL6YL became ours in no time flat and, just as quickly, was in use on the air. Jill ZL2DBO as a call-sign trustee, suggested to the Executive that we get a new QSL card printed for our new call. There was considerable discussion on this. Bev ZL1OS investigated prices and Dianne ZL2USO designed us a beautiful card. Bev then got them printed for us as a donation. Ladies, we have some talented and generous people among us.

I would like to thank the members of the Executive for their regular attendance, their constructive input and their friendship. I would especially like to thank our efficient secretary Bev ZL1OS who never seems to forget anything and is jolly good at reminding tardy Presidents that they should have called the net five minutes ago! All your Executive this year have been on the ball and well able to do the job. For the coming year we again have a good and efficient team. Sadly though, at the time of writing this a Treasurer and a Contest Manager are still being sought.

The latter is not a desperate situation and can wait till November. The Treasurer's position however is vital and will need to be filled ASAP, today if possible. Which brings me to another matter, this year for only the second time in WARO's history we had an election. Both occasions were for the President's position and on both occasions it was gratifying to see the large response we had from members in returned ballot papers. Ballots can be expensive and time-consuming but I for one would like to see more of them occurring. We have among our numbers, as I have already mentioned, many talented people. I would like to see more YLs putting forward their names for officers of the club. It is very nice to be *accepted* as an officer but it is *wonderful* to be elected.

Once more I would like to thank the executive for their sterling work, but also I would like to thank you ladies as representatives of our membership for coming here and making your presence felt. Have a good year, may all your frequencies be clear, uncluttered with QRM or N, may everyone be listening when you do it well and no-one at all when you muck it up.

73 Chris ZL1BQW

Awards report

During the past year the NZWARO Awards scene has been very quiet with little interest noted and it is rather disturbing to report that there have been no applications received for any of the WARO-sponsored awards. A record which I am sad to have to report. Where have so many of our active members from the past gone? I am well aware that some are buried under a heap of paperwork, but please try and make an effort.

On a happier note I was very pleased this year to receive nominations for the NZWARO Achievement Award, because the trophy has been hiding out at NZART Headquarters in our display cabinet for some time. It is now my pleasure to announce that the 1996 recipient of the Myrtle Earland Memorial Rosebowl for the NZWARO Achievement Award is Dawn Young ZL2AGX. Dawn was nominated for her outstanding service to NZWARO and Amateur Radio and the nomination reads as follows:

"Dawn has been Treasurers, *Break-In* WARO sub-editor, and is currently serving as Past-President and DX Secretary of WARO. She has been a very active member of Kapiti Branch 69 serving as Treasurer, also organizing field days, and is involved with AREC Section of the Branch helping out with communications during searches. Dawn was made a Life Member of the Kapiti Branch for her outstanding service.

"Dawn is an active member of the Counties Net and acted as Net Control two nights a week for some time and even took the mobile out to activate rare counties. Dawn belongs to the International Ham Host Group, and as a

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result has opened her home to many visiting Amateurs from many overseas countries and also travelling ZLs, making YLs and OMs very welcome.

"Dawn sponsors a number of DX YLs, she always goes out of her way to speak to YL operators on the radio and also at conferences, market days and YL get-togethers. She is always found on the YL DX Nets, and is a very active contest and awards hunter. Dawn gives her time to WARO and Amateur Radio very unselfishly, encouraging amateurs and YLs in all aspects of Amateur Radio from CW to Packet.

"She is a member also of ALARA, CLARA, YLRL, JLRS, BYLARA, DLYL, YLISSB 14706, and NZART and during her travels overseas she has been able to meet some of her sponsors. She keeps in touch with her sponsors on the air and by letter. She is a great ambassador of WARO and is a very worthy recipient of this trophy."

Congratulations Dawn from WARO members and fellow amateurs.

Jeanne Gilchrist ZL4JG
Awards Custodian

Thelma Souper Memorial Contest Report/Results 1996

This will be my last report as Contest Manager. For the most part I have enjoyed the job and recommend it to anyone. Presenting the report is one of the pitfalls of the job, however, the old adage about "pleasing some of the people some of the time" definitely applies here! Once again this year there was a bit of pushing and shoving, frequency stealing and other shenanigans going on. One OM commented that not all OMs were gentlemen, I could have replied that not all YLs are ladies! All in all though the contest was fun and mostly good nature prevailed. A real disappointment for me was the low number of YLs on air and then the even lower number of log sheets that arrived at my QTH. However, the high-scoring contestants that I note towards the end of all submitted logs and so the true winner could be established.

Without further waffle from me, from logs and check logs received and my own observations, 23 YLs were *bona fide* multipliers, that is including ZL6YL twice, giving the OMs the full 23 and YLs 22.

The OMs results in reverse order are:

3rd John West ZL1JAW	3,427
2nd Jonathon Herbert ZL2BPW	3,519
1st Alex Learmond ZL1BVK	3,657

The YLs results are also in reverse order:

3rd Pamela Blackett ZL1PAM	6,240
2nd Eileen Bain ZL1BRX	6,500
1st Bev Osborne ZL1OS	6,908
1st VK YL: Pat Pavey VK3OZ	1,729

Scoring order of log sheets received:
ZL102 6,908, ZL1BRX 6,500, ZL1PAM 6,240, ZL2DBO 6,175, ZL1WA 4,884, ZL3AE 4,805, VK3OZ 1,729, ZL2JP 1,680. ZL1BVK 3,657, ZL2BPW 3,519, ZL1JAW 3,427, ZL1AGO 3,404, ZL1HV 2,794.

Check Logs (gratefully received with open arms):
ZL1BTP, ZL2DBR, ZL2AZY, ZL1ALK, ZL2AGX, ZL2BOV, ZL1ALE, ZL1ANN, ZL2TSJ, ZL2AWH, ZL2ME, ZL2QM.

1996/97 Officers

Patron: Pearl Neilson ZL2QY.

President: Christine Armstrong ZL1BQW.

Vice-President: Jill O'Donnell ZL2DBO.

Secretary: Bev Osborne ZL1OS.

Treasurer/Membership Applications: Anne McMaster ZL3VR.

Executive Members: Ann Hotson ZL1ANN, Cathy Purdie ZL2ADK, Sharron May ZL3AE.

Awards Custodian: Eileen Bain ZL1BRX.

Contest Manager: *Still vacant—applications welcomed by the Secretary.*

Bulletin Editor: Ann Fraser ZL3TNT.

***Break-In* Columnist:** Margaret McConnachie ZL3UD.

Sponsorship Secretary: Dawn Young ZL2AGX.

Librarian: Margaret McConnachie ZL3UD.

Official Broadcast: Cathy Purdie ZL2ADK.

Net Controllers: As previous—will confirm in next issue; weeks and call-signs.

Please contact any of the above regarding any matter you wish to bring up for Executive or WARO notice in general.

Certificate of Achievement

The above was awarded to Aola Johnston ZL1ALE for her services to Amateur Radio since 1966. Well done Aola for all you have done for WARO and congratulations from all of us!

30-Year Certificate

A 30-year Certificate was awarded to Clarrie Hoban ZL1BDZ for 30 years' continuous membership of WARO—a great achievement—well done Clarrie from all of us!

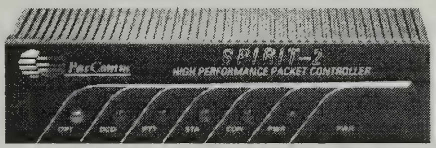
WARO Raffle

A raffle was held during the AGM and won by Chris ZL1BQW with No. 64—well done Chris and thanks to Gwen ZL2OI for donating a great prize!

Annual Membership Award

For another year we have a YL representative in the Youth Awards of NZART and the annual subscription was awarded to Lynley Simpson of Murchison—well done Lynley! Enjoy your first year as a WARO member and we hope to hear more of/from you in the future.

Well after such a marathon column I will leave you to recover for another month and catch you all in August!



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OLD TIMERS' CLUB

Compiled by
GORDON COOPER
ZL1KL

Silent Keys

We note with regret the passing of E. G. (Ernst) Gibbins ZL1ANR, OTC1053 after a short time as a member.

New Members

Our numbers keep increasing. A warm welcome to:

H. H. (Hugh) Stevenson ZL3UB	OTC1057
J. A. (John) Walker ZL4RS	OTC1058
A. G. (Alan) Hughes ZL3KR	OTC1059
F. E. (Frank) Barlow ZL2NB	OTC1060

1996 AGM

With Val ZL2AJ presiding, the 1996 OTC Annual General Meeting took place on a wintry Wellington morning. Coats, scarves and woollen hats were the order of the day as the Victoria Student Union building's heating system struggled to keep us warm. Nevertheless it was a cheerful occasion with the added opportunity to put faces to voices and call-signs.

In his Secretary's report, Peter ZL1LR commented on a net gain of 23 members for the 1995–96 year. He thanked the Net Controllers for their Sunday morning efforts, yours truly for this *Break-In* page, and mentioned the popularity of the OTC Award. The report contained an explanation of the new system for printing OTC Certificates. Previously these had been printed commercially. Now, nearly all OTC stationery, including the Blue Book is produced "in-house" by the use of the Anderson family photocopier, computer, and ink-jet printer. Printing costs have been reduced but it is necessary to make some charge for the book to cover maintenance and upkeep of the equipment.

Peter continued: "I often feel guilty as it seems that OTC is run in an autocratic way from the Secretary's office, but this has been the way for many more years than Anne and I have been involved." This comment brought a very quick response from the meeting. It was proposed by Roy ZL2KH, seconded Ron ZL2TT "That this meeting gives full permission to the Secretary not to feel guilty, and that he is to feel happy carrying on running OTC." This was carried unanimously with much laughter.

In another part of the report, Peter commented further about the job of administering OTC. He wrote: "We have held this office of Secretary/Treasurer for seven years and are happy to carry on, but there may be someone who is prepared to take the job on. Please do not let it get to the stage when we toss it in before a replacement is found. There should be a planned transition period to allow new officers to take up the reins. It is possible that the new members we have gained over the past year have new ideas to propel the club onward and upward in the Amateur Radio Fraternity, (let's not forget the input from the established membership), if so, let us know." This comment was discussed and the meeting acknowledged that Peter and Anne could not be expected to carry on for ever. The Secretary/Treasurer work is time-consuming and carries no recompense.

ZL1KL

OTC Officers

The AGM confirmed the election of Charles ZL2HS as the Grand Old Man for 1996–97 and that Wally ZL2GG should be GOM elect for the 1997–98 year. Marcia ZL2MX was appointed as Auditor. The two Dons, ZL1DAQ and ZL3SZ were confirmed as OTC District Representatives for the second and third districts respectively. ZL1DAQ replaces Silent Key ZL2BD and ZL3SZ replaces ZL3BJ who stood down. All other Officers remain in their posts. The meeting thanked all for their efforts.

Montgomery Cup

The OTC Montgomery Cup disappeared several years ago and, in spite of several searches and many enquiries, is has not been found. A new cup is to be purchased with costs met by NZART. The Cup is awarded annually to the OTC author of what is considered to be the best article in *Break-In*. The 1996 AGM considered the situation. A voice from the floor of the meeting proposed that the Cup be awarded to Frank ZL2NB for his story about ZLB Awarua. This was quickly seconded, a query from Chairman Val brought a chorus of "Ayes" and the award was made—until another voice, possibly that of ZL1LR said, "But Frank is not a member of OTC". General consternation, what do we do now? From the meeting came a third voice, "I know where Frank is, he's downstairs on the next floor, give me an OTC membership form, I'll sign him up."

Five minutes later Frank Barlow ZL2NB was formerly proposed, seconded and accepted as OTC member 1060. The Montgomery Cup Award proposal was again put to the AGM, and carried with acclamation. Congratulations Frank for a very good story. Who said that OTC was an autocratic group run by the Secretary? Long live democracy!

ZL1KL

Snippets from the AGM

H+ 50 Night was discussed, all agreed that the H+ 50 was a great success. The evening of Sunday December 8, from 1930 to 2200 was confirmed for this year's H + 51 exercise. ZL6OTC will be on air and any member who wishes to be on the roster to use the Club callsign should contact ZL1LR.

Fred ZL2AMJ talked about progress on the official NZART history and asked that anyone with historic/archival material (not equipment) should contact the historian at NZART HQ. Fred has a full set of *Break-In* but lacks some of the early Call Books.

Roy ZL2KH thanked the Net Controllers and all who take part in the Sunday morning OTC HF Nets. He would appreciate any comments about the success of the Nets, frequency and propagation problems, and anything else of interest.

From the Scribe

On present planning it is almost certain that I will be away for three months from mid-August. I intend to supply the *Break-In* editorial team with some material in advance and hope to find a few interesting stories overseas. ZL1LR and ZL1TAF will be providing Club notices, membership information etc., directly to the Editor. If anybody has anything for publication on this page before the end of 1996, would they please get it to me no later than July 20.

Until next month

73 from ZL1KL

Foot in mouth

Quoth a BBC commentator at the indoor bowls championships, "I'd give my right arm to be ambi-dextrous."

ZL1HV

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AREC AMATEUR RADIO EMERGENCY CORPS

with
STAN
ZL3AP

ZL4 SAREX.

GREETINGS. As the newly appointed OC AREC, I feel I should introduce myself and thank two long standing members for their dedication and efforts over the last seven years or so. Firstly, to Don ZL3RW, the retiring OC, who was appointed to the OC's position in 1989. Don came to the job after a long involvement with AREC as a Section Leader and Area Officer, which no doubt allowed him to learn a lot about SAR and CD. As the OC, Don certainly represented us well on the various committees in official circles in Wellington, as the various files I have inherited show. In the last two years or so, SAR has not escaped changes brought about by government economies and their desire to spend our dollars more wisely. Don retires after also having been President NZART from 1983–85 and having been made an Honorary Life Member of NZART in 1992, something which is not given lightly. Don, we wish you well and hope that a bit more time may be available to you for your other interests as an announcer on Plains FM, your cinematography and the interests in the Ferrymead Museum.

This is Stan ZL3AP's last column as collator of matters AREC. Stan has been bringing us all the reports and news for the last six years in *Break-In*. Stan is also involved (from its formation) with New Zealand Land Search and Rescue (NZLSAR) where Stan started to share some of the work load with Don and became a member of the Communications Sub-committee (CSC) of NZLSAR. Stan feels that it is time for a change of "scribe" and would like to devote his talents to NZLSAR and his involvements. I am sure we will hear from him from time to time as he reports on his CSC efforts. I am sure all readers of the AREC column would pass on to you, as I do, a big thank you for a job well done.

This then leaves an opening for someone to become the AREC Column editor. It is an important function to maintain this column to allow other members to read what's happening within AREC and to see "who is up to what". If you think you could contribute to AREC by becoming the *Break-In* column editor, please contact me expressing your interest. The bulk of the material is contributed by the report writers, but someone has to collate these for the *Break-In* editor.

Now, who is the new OC AREC? I am Brian ZL2TPS. Married to Cathy ZL2ADK and we are members of Marton and Districts Branch 23 of NZART, where I am the AREC Section Leader. I also hold an appointment on the Rangitikei District Council CD Committee and am an adviser to the Wanganui Police SAR organization. I have been a licensed Amateur for 26 years and hold a Novice extension to my Limited licence. The "salt mine" is at RNZAF Ohakea Air Base where I am employed as a Civilian Technician in the aircraft finishing section and previously I had served 26 years enlisted in the RNZAF. AREC is my main interest area as an Amateur and allows me to combine the outdoors with my hobby, while contributing something worthwhile to the community at large and having fun doing it.

There are many dedicated AREC members throughout New Zealand and my brief from NZART Council on appointment, was to review AREC. So it is to these members that we now look to start to take stock of our situation, plan for the future and ensure AREC accepts its place within the emergency services of New Zealand. AREC is the public service part of Amateur Radio and I am sure that all of us are willing helpers in times of distress. So, to ensure that this is done in an organized and effective way, AREC needs to look at how we do things and make any necessary changes that will enhance our operational effectiveness for the future. This will mean changes, but they must be soundly based for the good of all. There was a Parliamentary review of emergency services in 1995, with submissions now before a Select Committee; this will doubtless bring other changes that we become subjected to and have to react to.

Feel free to contact me on any matters AREC by telephone/fax (06) 329-3606. Packet @ZL2TCX or mail to 65 Hedges Street, Sanson.

CENTRAL OTAGO/DUNEDIN SAREX 1996

Location

Naseby, a small town at the top of the Maniototo Plain in Central Otago, approximately 140 km north-east of Dunedin. Population 98 people, nine dogs, 16 cats, 27 chooks, two pubs a general store and heaps of history.

The scene

Late afternoon on Friday, May 10, an 18-year-old female Scandinavian exchange student, who arrived in the country only two weeks before and with little English language ability, became separated from her orienteering team deep in the Naseby Forest. When she failed to rejoin her team at the completion of the course, a group of local folk entered the forest in search of her. Unfortunately one of that group, a 68-year-old retired Irish gentleman on holiday in the area, became separated from the searchers in the darkness and did not come out of the forest during the night. The Ranfurly Police were notified that two people were missing and the Dunedin Search and Rescue squad was subsequently requested to assist.

So began SAREX 96, a two-day exercise organized by the Dunedin and Ranfurly Police. The scenario which greeted some 75 Search and Rescue personnel at first light on Saturday May 11, was that two people were separately missing in the Naseby Forest as a result of the above orienteering activities. The personnel included Red Cross, Otago Mountaineering and Tramping Club, 4-W-D Club, Alpine Search Dogs, Police and AREC members from Dunedin supplemented by the local rural community SAR members.

AREC was represented by Peter ZL4SA from Ranfurly and Alan ZL4QK, Dave ZL4SB and Bill ZL4TAB from Dunedin.

The Naseby Forest Headquarters was taken over as FSHQ. A Communications centre was established within minutes, utilizing a recently completed regional Civil Defence "Air Support Cell" equipment container. This unit contains 2×100 channel VHF FM 25 W transceivers, a 10 W 720 channel AM Air-Ground transceiver and a multi-channel 100 W HF transceiver, plus all antennas, power and stationery requirements. Activation simply requires the container to be opened up, mains (or battery) power connected, antennas run out the window, frequencies dialled up and comms are operational. Ten minutes at most. We also had the benefit of having available the Dunedin City Civil Defence mobile "Emergency Communications Unit" (ECU), under the skilled command of Alan ZL4QK. A truly magnificent self-contained resource which contains every method and mode of communication which could be required during any emergency. This unit was deployed as a forward communications base and proved invaluable.

All communications with the field parties were conducted on VHF FM simplex, using AREC FT-73R handhelds along with Police SAR and borrowed Civil Defence Motorola GP-300 sets. With 12 teams in the field, the comms plan required two nets to be established, one for each search area for the different missing parties. As can be imagined the radio traffic was heavy and continuous. Frequencies used were CD-29 to the Alpine Search Dog teams, CD-12a and CD-12b to the search teams with a UHF link to the forward comms base.

The policy of this district of using simplex, is primarily to allow search teams to have direct communication with each other, avoiding some of the limitations of two-frequency repeater operations. If a repeater facility for base communication reliability is desired, a portable cross-band repeater is deployed to a convenient hilltop and accessed on UHF from the Search Base.

The forward comms base monitored all nets and provided relay facilities with any field parties which dropped out of simplex range from Base HQ, using both voice procedure and cross-band repeater techniques. It was also used to maintain comms on CB with the 4-W-D vehicles as well as monitoring 5680 kHz.

While reliable comms were achieved on HF, it was not used in this instance, VHF proving totally adequate. However, in monitoring the HF SAR frequency, signals from an operation in the Nelson area were noted and were perfectly readable (S9+). Apart from a courtesy call to the Nelson Base little HF activity was conducted here.

Our elderly gentleman was located fit and well during the early afternoon. All resources were then switched to the search for the missing exchange student, who was eventually located safe and well late in the afternoon. All personnel were withdrawn back to the local Town Hall for a debrief and a meal provided by a local ladies' club.

The SAR members from out of town (most of us) were then able to sample the night life of Naseby (both of them), where the hospitality is amazing. With the author having talked himself hoarse all day, Mine Host of the "Royal" took it upon himself to ensure the throats were sufficiently lubricated for the rigours to be expected the following day. Fortunately, the fatherly influence of ZL4SB prevented a potential disaster here.

Whilst all this was happening the notional scenario was being set for the following day's exercise. This involved two young local men who had set out during Saturday to do a spot of pig hunting in the Dansey's Pass area, and failed to return home that evening. Their father became a little concerned at their non-appearance and set out to look for them. He also failed to return home. The police were alerted by the mother and, as luck would have it, there just happened to be 75 SAR personnel in Naseby waiting to do something.

The exercise area was some 15 km from Naseby, but after an assurance from the Communications Team Leader, ZL4SB, that comms could be maintained throughout, a decision was made to retain the search HQ at the Naseby Forest HQ. The ECU was immediately deployed as a forward communications base to a strategic hilltop and we thus achieved VHF coverage into the search area even before the teams were despatched, again using cross-band repeater and relay voice procedure techniques where necessary.

A light aircraft was used to undertake an initial visual reconnaissance, with communications to the forward comms base and search HQ on 119.1 MHz. CD-12a was again used as the channel for communications with the search teams, with CD-12b as a safety link with the missing parties. The dogs played their part on CD-29 and CB again used with the 4-W-D Club boys. An alternate link to the ECU was set up on 5680 kHz with good results, although again little activity conducted here. The boys were located early afternoon, with one suffering a "pretend" fractured ankle, treated at the scene by Red Cross, and evacuated back to Base. The father was located shortly after with a "pretend" broken leg, again treated by Red Cross and evacuated to base. All teams were withdrawn from the field for a debrief and dispersed to home locations at 1630 hours. Pack up of search base comms was a reverse of the setup procedure, taking about 20 minutes including dismantling and packing away the HF dipole and mast.

All in all a successful exercise with most people coming away with positive comments, having learned a little more about a large-scale search environment. Communications were highly successful, although we did identify some areas which we can work to improve upon. After all the whole point of exercising is to uncover deficiencies in planning and procedures, and to work to correct them.

Particular thanks must go to both the Dunedin City and Otago Regional Civil Defence organizations for their generous support in terms of the willing loan of equipment, also to the volunteers who generously gave up their whole weekend. Congratulations to the Police team, headed by Sgt Brian Benn, Police SAR Co-ordinator Dunedin, and to Constable John Conway of the Ranfurly Police for the planning and organizing of a most successful combined SAREX.

Report by ZL4TAB/ZL4EX

Minutes of Annual Meeting of Amateur Radio Emergency Corps held in Wellington, June 1, 1996

Don Mackay ZL3RW—Office Commanding AREC in the Chair.

Sixty members present. Apologies received from Bill ZL4TAB/ZL4EX, ZL3IC and ZL1TTE.

Guests were introduced by Don ZL3RW—John Tristram Field Officer for NZ Land SAR Inc. Rex Aubrey Police Engineering. Stan Whitfield ZL3AP AREC Scribe. Brian Purdie ZL2TPS newly appointed OC AREC. Jim Rowe ZL1AVR AREC Secretary.

Don announced his retirement and thanked those people who have supported him in the past. Section Leaders were urged to plan ahead and keep their equipment up-to-date. With the changes taking place in the Police Department, Search and Rescue and Civil Defence, it has become very difficult to make precise plans for the future. Discuss your requirements with your Area Officer to ensure gear is compatible and easy to use. Applications should be addressed to Brian ZL1TPS.

Don was presented with a Certificate of Merit on behalf of NZART by Jim Meachen. Stan ZL3AP spoke of past experiences with Don and outlined possible future goals for AREC.

The meeting was then addressed by John Tristram who gave a brief history of SAR through to the development of a legal constitution and the registration of NZ Land SAR Inc. which is also registered as a Charitable Society with the Inland Revenue Department. NZ Land SAR is made up of a Management Committee and numerous sub-committees. Graeme Thorpe ZL2BCK is the co-ordinator of the Communications sub-committee and Stan ZL3AP is the AREC representative on this committee.

As a service provider, NZ Land SAR expect AREC will lift their standards to a task-based band performance-based level that will provide the very highest standard available.

Stan ZL3AP introduced Rex Aubrey and explained the functions of the Police Technology Group who are currently setting standards for the purchase of the best equipment available for specific jobs—including Police Search and Rescue.

His suggestions for AREC included—better education of users taking the equipment into the field; stress the importance of proper aerial use; become better acquainted with your Police Radio Technicians; ask to see transportable equipment including radios, aerials, and masts.; Nicad batteries should be discarded after three years—proper cycling is important.

New radios purchased are using primary cells which can be discarded after use. The Condor aerial is a combination day and night antenna and should be unwound all the way. The new Pulsar radio has separate aerials for day and night, but only a winder for each

QRP NEWS

with
BILL COX
ZL2BIL

THE double side band Jaycar kit mentioned in last month's column is now up and running successfully on 80 m. The circuit for this small rig appeared in *Silicon Chip*, November 1994, in an article by Leon Williams VK2DOB, which is the manual supplied with the complete kit. The kit is complete, everything except the power supply, earphones, microphone and antenna. It fits fairly tightly into its 20 cm×11 cm×6 cm Jiffy box.

The direct conversion receiver and suppressed carrier transmitter share a common oscillator which is configured as a Colpitts. Perhaps unusual is that frequency is set by a ceramic resonator which is pulled by a variable capacitance diode which is a Zener. There is a full description of both receive and transmit circuits which is easy enough to understand by the novice experimenter for whom this rig is intended.

Construction is fairly straightforward, although one point needs watching; the grounding of various components. Through holes are provided on the PCB, which has a ground plane on one side, but careful perusal of the board and diagram shows some components can have one leg soldered directly to the ground, while others have to have a dual connection to both track and ground.

It was this latter point that prevented the transmitter from working first time as one leg of a trimpot was not grounded. Once that was found—isn't it always something simple?—the rig fired up and produced excellent results. The fact that it would not receive first time was my fault, the earphones were wrongly connected. Both snags were cleared up by Dennis Young ZL2BFI who always deals with my asinine queries about everything connected with ham radio.

This is a simple rig, there are NO bells and whistles and you even have to switch from receive to transmit and back again, but even so it gives a lot of satisfaction when that first QSO is made.

As built, the rig tunes from about 3.54 MHz to 3.56 MHz, with a bit to spare either side, but could be made to tune higher up the band. No doubt other rigs will produce slightly different frequencies.

The first modification is already in the pipeline; that is to put in a voltage regulator, Zener and resistor. The rig was tried and tested with a Heathkit PSU which put out about 12 V, but when a 14 V PSU was used the frequencies moved down. Anything up to 15 V can be used says the manual, although 13.8 V DC regulated is the nominal supply.

Conditions were particularly poor when the rig was first put on air, the Solar Flux running about 66 and the A Index into double figures, but good reports were received from the hams on the CW learners' nets.

Barry ZL2US confirmed the audio was OK, but as he lives only a mile or so away that doesn't really count. Keith ZL1KJB gave a 46; Boyd ZL3LE 57; Les ZL1LFA 55—all the way from Awanui; Bert ZL2MU 55; and Joe ZL2JOE 34. All of which is pleasing, with an output of only 1.5 W and poor propagation.

Though limited, the rig is good value as a basis from which to start a construction career. As it's home built there is less inhibition about pulling the circuit apart and modifying sections. Other plans for this one are to get it going on CW by unbalancing the modulator, or perhaps to experiment with crystals as there is an alternative circuit provided for their use in place of the ceramic resonator. A larger case might be needed.

The kit came from DF Components, PO Box 82-272, Highland Park, Auckland and cost around $80. I'd like to hear from anybody else who has built this little transceiver so as to compare notes.

It was good to hear so many QRP rigs in action during the weekend of the Sangster Shield contest. In the week leading up to it the Drake had been screwed down to about 1 W and a few contacts had been made on CW, but come the day I chickened out.

Hearing all those immaculate signals, albeit with the occasional chirp and clicks, I decided my speed was not good enough to compete, although one unfortunate did have a somewhat mangled contact from me on the one occasion I stepped out and tried!

Still, I guess it was all good fun and it will be interesting to see whether there was another increase in the number of hams taking part.

Stations worked in the past month were Martin ZL2DU, whose 5 W from his Yaesu 101 and dipole were 569 here; and Morris ZL1ANF with the Drake wound down to 1 W. He gave me a 589, and thanks for the card. Those were on 80 m and heard were Alf ZL4SD/P vacationing in Paraparaumu, not far from this QTH, so he was 59 with his Argonaut on SSB; Brian ZL2AJS was in the same session putting out 2 W from Dannevirke and sounding well pleased with his new rig; and, on CW, ZL1ALZ. Also heard was ZL1HV with 2 W to a Windom.

This column was in the post before the June *Break-In* arrived so there is nothing from other TiToNZ to report, or should it be SPARTNZ—Small Power Amateur Radio Transmitters (0f) New Zealand? Sound a bit better, but I'd still like to hear from you. Contacts made, rigs used, antennas, ideas on how this column should be structured ... anything to do with QRP.

Address is as Call Book , or Phone (04) 298-8589, or Packet ZL2BIL@ZL2BJU. Look forward to hearing from you.

73 de Bill

Continued from previous page

aerial. The battery compartment of the new Pulsar is not as good as that of the Condor. There was some discussion on the provision of a USB/LSB switch on the new equipment. Satellite telephones, Internet and cellular communications are currently being explored as possible alternative means of communications. Alpha-numeric paging is the fastest-growing form of communications.

The meeting closed at 1600 hours.

Meeting of Amateur Radio Emergency Corps—Wellington June 2 1996

Members assembled at 10 am and were addressed by Peter Preston ZL2TD who demonstrated the EMICOMS message handling program which has been developed for Civil Defence in the Hutt Valley and Wellington area. Members were encouraged to ask questions and most were impressed with the sturdiness, flexibility and ease of use in this new development.

At 10.50 am, the meeting continued with ZL2TPS (the newly appointed leader of AREC) in the chair and he outlined some of the aims of the new management. Titles within the organization may be changed, but these changes will be subject to approval by the NZART Council and will be announced at a later date. New and existing Officers will also be confirmed by Council. In future it is expected that AREC Officers will be asked to carry a greater share of the workload and be more accountable in their positions.

As a member of the recent South Island Expo Committee, Stan ZL3AP spoke on projects organized in the South Island which included the running of seminars and there was some discussion on the possibility or arranging similar seminars in other parts of the country.

Further discussion took place on the preparation of a new publication to replace the existing AREC manual. It is recommended that more Sections prepare their own submanuals to cater for operations within their own districts.

On the subject of ID cards for AREC, it was moved and seconded that the Executive proceed with the production of ID cards. The call-sign of the operator will become the card number and expiry of the card will be set at five years. members will provide suitable photographs. This motion was passed unanimously.

It was agreed that there will not be a National Field Day in 1997.

Section Leaders nets will continue on the third Monday each month on 3.9 MHz USB at 1930 hours. The meeting closed at noon.

SPAM—Society for the Preservation of Amplitude Modulation

with
Rob Symon
ZL2KH

I AM writing this article a fortnight before our AGM to be held on June 1, 1996—but it will be over by the time you read this. There seems to be an apparent lack of understanding among some SPAM members regarding what I write in these articles. I have had it reliably reported to me that some members are upset that I have stated here that subscriptions are going to be increased. I have NEVER said that! What I did say (in the April 1996 issue) was "the AGM decides the subscription for the next 12 months and there is always the possibility that it will be increased from the present very low rate of $5.00 for a lifetime membership." Please note the "always the possibility". If you are not sure—please read that page again. From the inaugural meeting at the 1994 New Plymouth Conference all SPAM matters have been decided democratically by a majority vote of those present with the ideas of those who have been absent being taken into account—if they have told someone what those ideas were.

Another misconception that seems to be prevalent is that we are a New Zealand chapter of SPAM international. At New Plymouth it was decided that we would be a stand-alone organization, viz "SPAM New Zealand". There was an initial move to have us belong to the US organization but the original correspondence was lost, the person in the USA who wrote it had died, and subsequent letters have been ignored over there. Hence the decision at New Plymouth. Next month I will be reporting on the decisions made at the 1996 AGM held in Wellington. Remember—the AGM will be held each year in conjunction with the NZART Conference. That is the way it is until a majority of members at a properly constituted meeting decide otherwise.

New members

New members to welcome this month are:

101 Graeme Bateman ZL2BHD, Hawera
102 Athol Kemp N/T, Hawera
103 Maynard Harper ZL1AVJ, Whangarei
104 Ron Blackwood ZL2OY, Wellington
105 Neil Cromarty ZL1UXM, Auckland

Graeme ZL2BHD has now retired from his teaching and one of his projects is getting his ZC1 up and running on the AM nets.

Athol Kemp is not licensed as yet but has stacks of enthusiasm and is being helped by Graeme ZL2BHD. We expect the hear Athol on the air fairly soon.

Maynard ZL1AVJ joined SPAM to help reach 100 members before Conference. Thanks for the thought, Maynard, but it looks like you are now helping towards the second century.

Ron ZL2OY was first licensed in 1947. His first rig was a home-brewed CW one and later a modulator was added. At present he has a Heathkit DX60 with a 6146 final—it is screen modulated but with the present antenna he can't work the AM net. Let's hope you make the necessary changes soon, Ron.

Neil ZL1UXM joined through Phillip ZL2IM (our SPAM librarian) when he was requesting information to get some gear going—a very promising sign, Neil.

Members' wants

John Jago ZL2DBX wants a circuit diagram for an AWA receiver, Type 7 2C677A, NZPO type 643.

Graeme Bateman ZL2BHD wants circuit and/or manual for a Heathkit oscilloscope 0–12.

Anyone who can help either of these members should contact them direct—or I can hand on anything sent to me.

If you need anything for a project you are working on just drop me a line for it to be included here. If you require a circuit diagram or service manual there is a good chance we will have it in the SPAM library in which case send the enquiry to Phillip ZL2IM.

Contributions from members

I have mentioned serializing an article about ZC1 modifications that was sent to me by Mike ZL2MP. I offered it to our *Break-In* Editor as a standalone article and he has accepted the offer. Keep an eye open for it—it is most interesting. This leaves me with only two or three short articles on hand for this page and contributions from members would not only be most welcome, they are fast becoming essential if we are to keep this space. Any size article will do as long as there is an involvement of Amplitude Modulation. They could be about such diverse matters as your early experiences in radio, simple construction or modification ideas, thoughts for the improvement of SPAM, or whatever. I am willing to tidy them up if necessary. Please grab a pen and paper and put something in writing NOW. I will publish any opinion—as long as it is not profane, seditious, libellous, or makes a personal attack on any person—criticize policies, not the people involved—surely radio amateurs can rise above the level of our leaders in the Beehive.

VHF and/or UHF

It has been mentioned to me once again that it would be a lot of fun to get some of the early 1950s and 1960s VHF, UHF gear that operated on AM going again. How many of you started on this mode and these frequencies? How many of you still have your original gear cluttering up the shack or shed? How many of you can remember using 6CW4s or 5763s? How many of you have ex-commercial gear that would be suitable (with a few modifications) that you bought at a Junk Sale? How many would be prepared to write an article for publication here to help someone else get started? I am sure that FMTAG could find us a spot on the 2 m and 70 cm bands for this activity.

Junk sales

A couple of weeks ago I had a most enjoyable day at the excellent Wanganui Junk Sale. There are lots of older pieces of equipment and parts sold at these occasions which led me to wonder what happens to them when you get them home. Are they sorted through and put aside for the next Junk Sale? Are projects started and then stopped for lack of information or help? Are they stored away and forgotten forever? It would be great to think that eventually they would lead to more AM signals on the air.

AM frequencies

Bill ZL2DJ has dropped me an article from *QST* about the AM Radio Network that operates in the USA. The calling frequencies listed are 1880–1900 kHz (160 m), 3885 kHz (80 m), 7290 kHz (40 m), and 14286 kHz (20 m). Keep an ear open and join them if you can. I am keen to hear reports from anyone who has either heard them or has had the luck to actually have a QSO.

That's it for this month. Next month should include news of the happenings at the Annual General Meeting and other AM matters from the Conference in Wellington.

Roy Simon ZL2KH
Secretary/Treasurer

Jaycar
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DF Components is proud to announce our appointment as dealer for Australian-based Jaycar Electronics. All items in the Jaycar catalogue, or their advertisements in any of the Australian electronics magazines, are now available within New Zealand through us. A growing part of the Jaycar range is available from stock for immediate despatch. For example, kits:

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KC5059 RadFax Decoder Kit (*Silicon Chip* November 1989)	$49.45
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ARDF AMATEUR RADIO DIRECTION FINDING

with
MAX WHEATLEY
ZL2MAX

WHAT'S been happening? Well, not a great deal. What is happening around your area? Take the time to drop me a note so that we all know what is happening.

HF equipment

I have placed an order with Ron Graham in Australia for 16 HF ARDF sets, and I hope by the time you read this that some of this equipment will have arrived in ZL and been built so that we can use it in the Region II games in Townsville later this month.

The HF receiver is housed in the same diecast box as the VHF receiver. It is a dual conversion superhet using the following line-up: NE602, MC3390, NE602 LM386. Other features include varicap tuning and a ceramic filter. Those of you who visited at Conference would have seen a production prototype.

When this equipment is completed eight sets will go the South Island to be held by Ann ZL3VR and the other eight will join the North Island set. As usual these will be available to any Branch who would like to "have a go". Look forward to a review and photos in the August *Break-In*.

Capital Conference 96

We had a "forum" type event at Conference and a few people took the opportunity to visit. The weather on both days prevented any serious efforts to do anything on the ground.

Region III ARDF Games

By the time you read this all will be ready for this event. The competing team is as follows:

Women

Cheryl ZL2VCC (team leader)
Ann ZL3VR
Margaret ZL3UD
Denise ZL3TDW.

Seniors

Roo ZL2UKF
Jonathan ZL1AFZ.

Old Timers

Vaughan ZL1TGC
Ron ZL3TD.

International Referee

Max ZL2MAX.

This group will compete in both HF and VHF competitions.

I am sure that this group will represent New Zealand to the best of their abilities but it is disappointing that we are taking such a small group, and in particular that we have no juniors. There are several other people accompanying this group providing support. The September *Break-In* will carry an article complete with photos and a few stories.

Till next time, happy hunting.

ZL2MAX

FMTAG

Secretary
STEPHEN McNEILL
ZL4HG

23 cm repeaters

The FMTAG column marks the introduction of two 23 cm repeater proposals in the Auckland area. We welcome these proposals which will, we hope, provide good service to amateurs in a wide area. We have chosen frequencies for both these services with offsets of –20 MHz, which is the IARU Region III recommendation.

10 m repeater

In the interim recommendations for this month there is a proposal for a 10 m repeater by the South Auckland Repeater Group (SARG). We understand that the group wishes to use a split transmit/receiver site, and use a radio link between the two. We have asked the group for more details, and the interim recommendation is subject to these details being received.

Interim recommendations

The South Auckland Repeater Group (SARG) wish to establish a 23 cm voice repeater in the 23 cm band. We have chosen 110 (1291.100 MHz transmit, –20 MHz offset) as the best frequency for this new service. This repeater is to be known as "Auckland 110" and will operate from a point on the Sky Tower in central Auckland city, on InfoMap 260 Series Map R11 676822.

The Auckland VHF Group, Branch 66 NZART, wish to establish a voice repeater in the 23 cm band. In accordance with the wishes of the Branch, we have chosen 180 (1291.800 MHz transmit, –20 MHz offset) as the best frequency for this new service. This repeater is to be known as "Auckland 180", and will operate from a location in Mt Roskill, Auckland, on InfoMap 260 Series Map R11 655765.

New Plymouth Branch 27 NZART wish to establish a data repeater in the 2 m band. We have selected 5575 (145.575 MHz transmit, –600 kHz offset) as the best frequency for this new service. This repeater is to be known as "Taranaki Data 5575", and is to be located at Jackson Point Lookout, on InfoMap 260 Series Map P20 051098.

The South Auckland Repeater Group (SARG) wish to establish a voice repeater in the 2 m band. We have chosen 5775 (145.775 MHz transmit, –600 kHz offset) as the best frequency for this new service. This repeater is to be known as "Auckland 5775" and will operate from a point on the Sky Tower in central Auckland, on InfoMap 260 Series Map R11 676822.

The South Auckland Repeater Group (SARG) wish to establish an FM voice repeater in the 10 m band. We have chosen 29.640 MHz transmit, –100 kHz offset, as the best frequency combination for this new service. This repeater is to be known as "Auckland 10 metre" and will operate from Ponga Hill in South Auckland, on InfoMap 260 Series Map Q12 885517.

The Christchurch Branch 05 NZART wish to establish a beacon in the 32 cm band. In accordance with the National Band Plan for beacons, we have chosen 925.285 MHz as the frequency for this service. This is to be known as "Christchurch 32 cm", and its precise location is subject to site negotiations, the results of which will be advised as soon as possible.

Final recommendations

There are no final recommendations this month.

Comments

As always we value your comments and suggestions on the above matters and recommendations, or indeed on any other FMTAG matter. Your comments should be sent to FMTAG, NZART Headquarters, Box 40-525, Upper Hutt. The closing date each month for issues to be dealt with in that month is the 20th of each month, except for December when there is normally no meeting.

Applications for repeaters, beacons, digipeaters and so on should be made on FMTAG Form 10, which may be obtained from the above address. Completed forms should be sent to the same address.

Help Wanted

Communications Receiver Yaesu Model FRG-7700

My dad has the above-mentioned receiver and it is out of order. There is no sound from the speaker. He is in Malaysia and has asked me to locate a circuit diagram for him. Could you please help me with the address of Yaesu in Japan or whether their agents in New Zealand could help. Enclosed is a self-addressed envelope. Any information forthcoming is very much appreciated.

Thank you.

Yours sincerely
Victor Kong

SATELLITE NEWS

by
IRVING SPACKMAN
ZL1MO

GREETINGS once again to all our readers. I trust those of you who were at Wellington Convention enjoyed the weekend. It has not been a very auspicious start to the month has it, with the news that the Ariane-501 launch with the four satellite "Cluster" on board had to be destroyed about 30 seconds after launch when it veered off course, and the range safety officer "pushed the button!". What this will do to the AR-5 programme, and of course the launch programme for Phase-3d, we won't know for a while, but current news indicates that the September launch is still being scheduled for that time. The latest news to hand indicates that the failure has been attributed to a software problem! (See also comment in Phase-3D report later.)

Further to the short note "Another Satellite Venture" on page 25 of last month's *Break-In*, there have been a number of important Packet messages from ARRL, AMSAT, and other concerned groups, regarding proposals to *possibly* (note possibly) appropriate some amateur VHF and UHF allocations, for use by the new generation of Global Communications, using Low Earth Orbiting (LEO) satellites which have been pioneered by Amateurs. This note refers to just one of many systems that have been planned since the early 1990s, and on which I have an extensive dossier. Back in 1992 the US Federal Communications Commission awarded experimental licences to Motorola—the "Iridium project—66 satellites" and four other rival consortia to test their proposals via a small number of satellites. What the real threat now is that the commercial consortia with their billions of US dollar capital are eyeing some of the most attractive "chunks" of "free" spectrum with proven performance records. Many of us have preached "USE IT OR LOSE IT" for years. The threat is now there and REAL! What we need is a significant and continued move towards the use of all our VHF, UHF and low Microwave frequencies up to at least 5 GHz (presently under threat) and it must be NOW, not next month, or next year! We need regular use and permanent band occupancy to support our protests. This is not just for the future of us satellite users, it is in the interest of ALL amateurs.

I am preparing a survey of the various proposals back over the last five years, for publication in *Break-In*. Please read it and act!

AO-13 operations

By the time you read this the attitude change on June 17 to 220/0 will have been done, and thus the new Transponder Schedule through to September 2 is as follows:

Attitude	**220/0**
Mode-B:	MA 000 to MA 140
Mode-BS:	MA 140 to MA 240
Mode-B:	MA 240 to MA 256
Omnis:	MA 250 to MA 140

Don't forget that if there is any updated information relating to the schedule then it will appear in the various beacon transmissions on AO-13, under the following schedule:

PSK format on 145.812 or 145.985 MHz (400 bps PSK decoder required).

RTTY format 15 and 45 minutes past the hour.

CW format 0 and 30 minutes past the hour.

NOTE: 400 bps PSK can be processed with PACCOM PSK1/1T modems, and many of the current DSP products. Phase-3D will continue to use 400 baud PSK, so it will remain as an on-going telemetry monitoring system. Display software for this data can be processed by P3TLM, P3C.EXE (MS-DOS) or WINSAT software.

Continuing our study of AO-13's perigee height, here is the list to date. Plot these heights against date and you should be able to see the change in slope, due to the onset of atmospheric drag in the next few months. Height in kilometres 1995: July 12, 562; August 2, 544; September 4, 526; October 6, 503; November 5, 485. 1996: January 2, 413; February 5, 398; March 3, 372; April 2, 348; May 6, 304; June 6, 271. Note—this perigee height is about that which the next Shuttle mission is in orbit. I wonder if they will catch sight of AO-13 as its perigee is about 40°N latitude at present.

I have been looking spasmodically at AO-13's Whole Orbit Data (WOD) for Solar Panel #1 temperatures. The data which is easily read appears in Hex. This needs to be converted to Decimal and then the following formula can be used:

$$\text{Temp} = (n-120)/1.71\,^\circ\text{C}$$

Example: 8B (Hex) = 139 (Decimal)

$$\begin{aligned}\text{Temp} &= (139-120)/1.71\\ &= 19/1.71\\ &= 11.1\,^\circ\text{C}\end{aligned}$$

Some recent data showed that most of the orbit Hex values ranged around 8A to 8C. When passing through eclipse the temperatures dropped to around 4C to 4D. However, when AO-13 went through perigee, temperatures rose from 8C to 9B and back over about 25 samples. Using the formula above, 9B gives a panel temperature of 20.5°C. This gives possible indication of the start of atmospheric friction heating.

WEBERSAT update

A further package of software was reloaded to WO-18 and, as of May 25, it was transmitting telemetry and spacecraft status information. WO-18 was checked on June 1–6 transmitting AX-25 flags, but no data. The downlink signal strength appeared to be normal.

Bob KB7KCL reports that when WEBERSAT is successfully reloaded it will be sending several new telemetry frames:

The WASH-0 frame is the time (four bytes as seconds after January 1 1970 UTC, least significant byte first) and EDAC counter (one byte) of the last 50 single-event upsets detected in the EDAC RAM.

The WEBTLM-0 frame is a real-time four byte time, then 100 channels (as one byte channel number, one byte value) of 67 measured telemetry channels as at present, 13 calculated telemetry channels, and the 20 status bytes.

The WEBTLM-1 frame is the same format as WEBTLM-0, except it is not real-time.

The WEBTLM-2 frame is the same format as WEBTLM-0, but it is sent as a burst upon command.

The WEBTLM-3 frame is the same format as WEBTLM-0, but it is sent individually upon command.

The WEBTLM-4 frame is human readable, accepting a command to store telemetry and status during a certain period.

The WEBTLM-5 frame is human readable, rejecting a command to store telemetry and status during a certain period.

The WEBTLM-6 frame is human readable, indicating start or finish of moving the data in the RAMdisk.

The WEBTLM-7 frame is a four byte time, indicating the requested data for that time is not available.

The WEBTLM-8 frame is human readable, indicating that PHOTO or SPECT frames will temporarily stop sending for up to 15 minutes, or will resume.

Phase-3D report

The most recent information to hand regarding the launch situation comes from AMSAT President Bill Tynan W3XO. There have been a few changes to the situation recently. INTELSAT, who were to launch their new 709 series spacecraft on Ariane 502 have cancelled (not related to the loss of 501) and are making arrangements for an Ariane-4 launch soon. This may have meant that Phase-3D might have been able to go on Ariane 502. However, it seems that negotiations were underway for another customer to take over the vacancy thus precluding our opportunity.

What the situation will be now (post-501 loss) is anyone's guess!

So far I have not covered any of the "experimental" modules which are included within Phase-3D. A very interesting unit is "SCOPE". This stands for "Spacecraft Camera experiment for Observation of Planets and Earth". This experiment built by members of JAMSAT contains two high resolution 3-CCD (Charge Coupled Device) image sensors, that provide wide and zoom cameras for snapping views of earth and other celestial objects. This project, which has been underway since 1990, has built three flight modules (one to be launched and two for backup and test use).

SCOPE is a microprocessor-based digital camera, which will connect via its own CAN-BUS LAN system to the Phase-3D main computer interface. It also has an interface with the RUDAK as a backup link. The choice of a microprocessor control system means that the cameras are completely independent of the other systems, enabling greater flexibility. The SCOPE project team expects to change and improve its operating software, once the spacecraft is operational, and then some commands may be released to Amateurs, so they can use the "remote controlled camera in space", controlling SCOPE and downloading images via Packet data. There have been 22 .JPG type graphic files depicting the development of SCOPE available via the various satellites, and I have viewed a number of them. They are certainly interesting.

I have forwarded a document to *Break-In* for publication, entitled "An Overview of the Phase-3D Programme". When that has been published, I will elaborate in detail on other items of equipment that will "fly" on Phase-3D.

MIR and SAFEX-2 news

From Peter DB2OS for the SAFEX Group in Germany comes an update. The following are the 70 cm frequencies to be used for communication with the SAFEX-2 equipment located in MIR's PRIRODA module.

Mode-1 (repeater)

Downlink: 437.950 MHz
Uplink: 435.750 MHz
CTCSS: Yes
Speed: —

Mode-2 (Packet)

Downlink: 437.975 MHz
Uplink: 435.775 MHz
CTCSS: No
Speed: 9600 baud

Mode-3 (QSO)

Downlink: 437.925 MHz
Uplink: 435.725 MHz
CTCSS: Yes
Speed: —

Mode-1: Like a standard FM repeater with CTCSS.

Mode-2: 9600 baud (G3RUH compatible) Packet operation.

Mode-3: QSO possibility with MIR crew, but CTCSS is used.

The first activation of SAFEX-2 in Mode-1 (FM repeater) is scheduled for June 1. The CTCSS tones required for these modes will be published at a later date after equipment testing is complete.

STS Mission update

The next mission carrying SAREX will be STS-78, currently scheduled for launch on June 20 at 1449 UTC on Space Shuttle *Columbia*, from the Kennedy Space Center, for a 16-day microgravity mission. SAREX operation will use FM voice and Packet robot (SAREX configuration "C"). Landing is scheduled for July 6 at 1246 UTC, also at Kennedy. The launch will place *Columbia* into orbit at an altitude of 278 km (173 statute miles) and an inclination of 39°.

The crew of STS-78 are Commander Terence Henricks, Pilot Kevin Kregel, Payload Commander Susan Helms, Mission Specialist Richard Linnehan, Mission Specialist Charles Brady Jr., Payload Specialist Jean-Jacques Favier and Payload Specialist Brent Thirsk.

Susan Helms KC7NHZ is on her third shuttle flight. She was on Shuttle *Endeavour* during STS-54 in 1963, and last operated SAREX from *Discovery* during STS-64 in 1994. Charles Brady Jr. N4BQW and Canadian Brent Thirsk VA3CSA, are both on their first mission.

On this mission, *Columbia* will carry the Life and Microgravity Spacelab, to conduct experiments in the weightlessness environment. Experimenters from around the world will conduct a wide variety of experiments, some of which will focus on the effects of weightlessness on human physiology and function.

Eleven schools from around the world have been selected to make contact with the shuttles during this mission. Two or more students at each school will ask questions of the astronauts during these contacts. In our part of the world Toowoomba State High School, Queensland, and the Catholic Ladies' College, Victoria, Australia, are on the list.

On this mission the FM Voice downlink is 145.55 MHz. FM Voice uplinks are 144.91, 144.93, (144.95), 144.97 and 144.99 MHz. The bracketed one is the standard –600 kHz split, and the most likely one, but check the others if you can.

The FM Packet downlink is also 145.55 MHz with the Packet uplink 144.49 MHz. Calls which can be used are: Voice—KC7NHZ, N4BQW, VA3CSA. Packet:W5RRR-1. QSL to: ARRL EAD, STS-78 QSL, 225 Main Street, Newington, CT 06111-1494, USA. Remember to include the following: STS-78, date, time in UTC, frequency and mode. In addition, a stamped-addressed business-sized envelope must be included plus IRCs or US$1.00 to cover postage. "The Net" in Anacortes, Washington State has generously volunteered to manage QSL cards for this mission.

The following mission, STS-79, on Space Shuttle *Atlantis*, is scheduled for launch on August 1 10 0342 UTC and will also carry SAREX, but as this will be a MIR linkup mission, operation will be limited to Voice contacts only, using the MIR link equipment.

FUJI-OSCAR news

A recent report from Kazu JJ1WTK advises that the upcoming FUJI, JAS-2 is still scheduled for a launch in August. HAS-2 has been allocated the call-sign 8J1JCS, and will carry both linear and digital transponders. The operating frequencies for Analogue and Digital Modes and the CW beacon are the same as for FO-20, that is:

Analogue uplink: 145.900–146.000 MHz.
Downlink: 435.900–435.800 MNHz.
CW telemetry: 435.795 MHz at 12 wpm.
Power out: 1 W.

Digital Mode: 1200 bps BPSK NRZ-I.
Uplinks: 145.850, 145.870, 145.890, 145.910 MHz.
Downlink: 435.910 MHz.

In addition 9600 bps FSK NRZ-L will be available.
Uplink: 145.870 MHz.
Downlink: 435.910 MHz.

A Digitalker using FM Voice Mode will transmit for up to 25 seconds on 435.901 MHz with an output power of 1 W.

More details regarding the spacecraft were published in the December 1995 column on page 37. Briefly, a new attitude stabilization system employing a combination of sun, and earth magnetic field sensors, plus magnetorquer coils, will produce a controlled spin, but the spin axis will be 90° to the orbit plane, so the satellite will appear to "roll along" the orbit. Because of the motion, only part of the ring-shaped 2 m antenna which is the same as in FO-20, will be visible to the earth, so polarization will be horizontal when viewed from below the orbit, vertical when approaching or receding on near overhead passes, and mixed when seen from either side. The turnstile antenna for the downlink is essentially the same as for FO-20 and will generate RHC or LHC depending on which transmitter is used. However, because of the spacecraft's attitude, the performance of this antenna is rather difficult to predict, so we await the launch with interest. The elliptical orbit is planned to be 99° inclination, with 1500 km apogee and 800 km perigee.

AMSAT orbit data review

Ray WA5QGD, AMSAT-NA's Orbit Data Co-ordinator, recently reviewed which satellites to include in the weekly Keplerian element list he distributes. After requesting comments from users worldwide, Ray has decided to drop only ARSENE and FY-1/2 from the current list. OKEAN-1/7 and SICH-1 have been added to the list. In addition AMSAT Keplerian data will be sent in only two files named orbs$xxx.ams (the AMSAT format file) and orbs$xxx.21n (the NASA "two-line" file).

Short snippets

- DOVE (DO-17) remains off following problems first experienced last December when the onboard computer (OBC) crashed. Jim White WD0E, one of the DOVE Command Team, reports that ground controllers have ruled out a few hardware problems, but have come no closer to identifying the actual cause of the problems with the OBC. The satellites is occasionally transmitting data Packets on 145.825 MHz.
- ITAMSAT (IO-26) has been reactivated! A

Continued on next page

LETTERS TO THE EDITOR

Raffles

Dear Sir

From time to time clubs receive raffle books from various clubs endeavouring to raise funds for worthwhile causes. Invariably, the covering letter states that the raffle has the approval of NZART. In some instances this seem to encourage the promoters to send out large numbers of raffle books, in the belief that because it is NZART-sanctioned the tickets will sell. This does not happen. As a consequence large numbers of tickets are returned unsold, probably on or after the deadline, resulting in much less than anticipated return of funds.

We would like to suggest that any club wishing to run a raffle first contact the clubs they wish to involve, asking for their support, the possible number of tickets they would be able to sell, together with the proposed prizes. We feel that this information would give a much more reliable basis for budget forecasts than the current fatalistic approach.

Nelson Amateur Radio Club Inc
Hon. Secretary

Six Metres—A Chronology

The article in *Break-In*, May 1996, is a valuable historic record of the ups and downs of this unhappy band. It is mainly factual and correct, though unfortunately tainted with a few errors and off-the-cuff comments. Errors most involve misquoting frequency ranges—eg. 43–58 Mc/s should be 48–53 Mc/s (an early TV channel recommendation) and in several places the 50–54 MHz band is incorrectly stated as to frequency range.

Of more concern, however, are comments such as "It is surprising that 50–54 MHz has survived in the minds of amateurs as a uniform notion of a six metre band". It has survived, reasonably enough, because most overseas countries, including Europe, Asia and Africa, have followed the American lead and allocated these frequencies to amateurs following the progressive shift of TV to higher and more suitable frequencies. A uniform allocation in this area is sensible to take advantage of DX openings and to further VHF knowledge. New Zealand is now almost alone in perpetuating the low VHF band for TV broadcasting.

Another comment that "6 m activity came to be associated as a more marginal activity" in recent times is also misleading. During the last sunspot peak as many as 50 countries have been contacted from ZL by upwards of 100 operators, on this band.

The present restrictive 50 MHz permit system has resulted in much anguish among six metre operators, particularly those in Channel 1 areas where TV now operates 24 hours a day. There is no hope in these places of obtaining a permit. An example of the anomaly is the various ZL VHF contests where the rules allow for contacts on the low end of the band. This precludes operators without a permit from working 50–50.15 MHz where most of the activity, particularly DX, occurs.

NZART should be concentrating its efforts, in association with other narrow-band users, on actively persuading the TV authorities to move to higher frequencies. In today's state-of-the-art, UHF is quite practical for wide-band modes, and is much more "environmentally friendly". This would release low VHF frequencies for more point-to-point activity, such as land and ship mobile, utility services and, of course, amateurs. The use of 7 MHz of band space at a base frequency of 44 MHz (16 per cent of the spectrum) for one TV programme is a shameful waste of spectrum in this age when hundreds of narrow band channels could be accommodated in the same space.

Yours sincerely
Bill ZL2CD

A message for our legislators

The ARRL has petitioned the FCC to compel state and local governments to reduce restrictive regulations on amateur radio antennas. Here is what they ask for.

1. State and local regulation of a station antenna structure must not preclude amateur service communications. Rather, it must reasonably accommodate such communications; it must constitute the minimum practical regulation to accomplish the state or local authority's legitimate purpose; and it must not impose substantial costs on amateur service licensees.

2. Any state or local antenna restriction on regulations which, on its face or as applied, would limit amateur station antennas below 70 feet is presumed unreasonable unless the promulgating authority can demonstrate that such regulation is necessary to accomplish a clearly defined, and expressly stated, health, safety or aesthetic objective; that there is no less burdensome alternative to the regulation; and that the Federal interest in efficient Amateur Radio communications from the amateur radio station at issue is otherwise reasonably accommodated.

3. Any state or local authority, or other entity that wishes to maintain and enforce zoning, land use or other regulations or restrictions inconsistent with this section may apply to the Commission for a full or partial waiver of this section. Such waivers may be granted by the Commission in its sole discretion, upon a showing by the applicant that local concerns of a highly specialized or unusual nature create an overwhelming necessity for regulations inconsistent with this section. No application for waiver shall be considered unless it includes the particular regulation for which waiver is sought. Waivers granted according to this rule shall not apply to later-enacted or amended regulations by the local authority unless the Commission expressly orders otherwise.

ZL1HV

Continued from previous page

message from IW8QII, on June 4, states, "From June 1, ITAMSAT IO-26 running very well, with good and pure signal."

Hopefully good news! I'll report on progress next month—ZL1MO

In conclusion my thanks as always go to the various AMSAT news services, ARRL, to those mentioned in the various reports, and to JG2BVO of JAMSAT.

Amateur Satellite Special-Interest Group

A meeting to discuss plans to establish a "Special Interest Group" for those with a current, or possible future interest in any of the Amateur Satellites, is planned for Saturday July 13, starting at 11 am.

The venue is the North Shore CD Headquarters at 400 East Cost Road, North Shore, Auckland (used also by NZART Branch 29 for meetings).

All are welcome, but should you not be able to be present but are keen to be involved or just participate, you may contact ZL1MO at Call Book address or mail, contact by telephone (09) 626-4886, or Packet to either ZL1MO or ZL1BIV @ZL1AB.

Thanks to the Editor for assisting with this notice at the 11th hour.

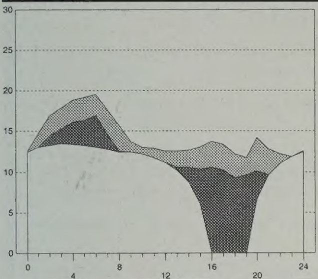
Auckland VHF Group (Inc) 40th Anniversary

The Auckland VHF Group (Inc) (Branch 66 NZART) is planning to celebrate the 40th Anniversary of its foundation (June 5 1956) on Saturday July 27 with a dinner at an Auckland venue. Some other activities on the day have been proposed, depending on the number likely to attend. As convenor of the 25th Anniversary Celebration Programme I have been asked by the current committee if I would again assist on this occasion. Current members of the group will see some details in our magazine "SPECTRUM" but this note is addressed to past members or others who would like to participate in this celebration with us. If you require further information please contact Irving Spackman ZL1MO at Call Book address, or telephone (09) 626-4886, or by Packet @ZL1AB before July 10.

IONOSPHERIC PREDICTIONS

JULY 1996

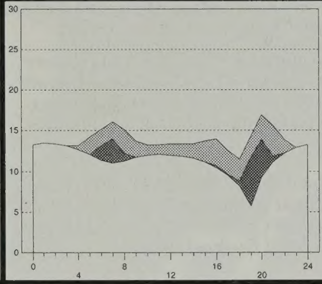
T=9



WN-
Moscow
(SP)

16548 km

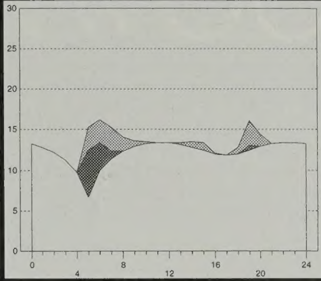
312°



WN-
London
(SP)

18814 km

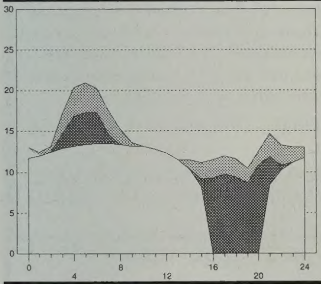
343°



WN-
Jo'burg
(LP)

28265 km

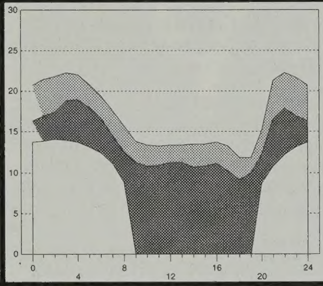
31°



WN-
Istanbul
(SP)

17168 km

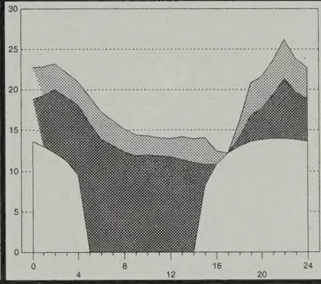
281°



WN-
Tokyo

9274 km

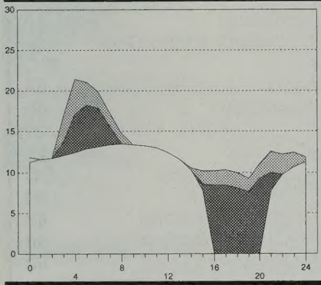
332°



WN-
San
Francisco

10859 km

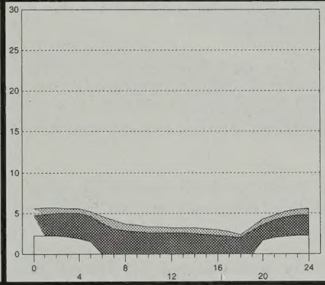
45°



WN-
Cairo

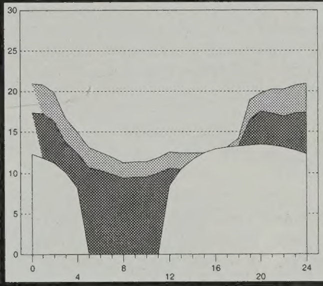
16519 km

261°



WN-
New
Zealand

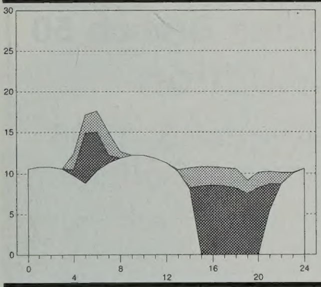
300 km



WN-
New
York

14402 km

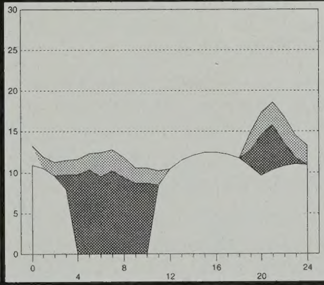
66°



WN-
Jo'burg
(SP)

11759 km

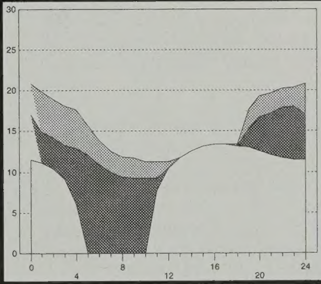
211°



WN-
Rio de
Janeiro

11780 km

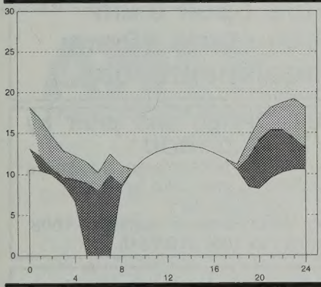
144°



WN-
Barbados

13962 km

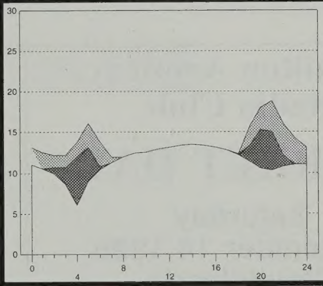
104°



WN-
Dakar

16862 km

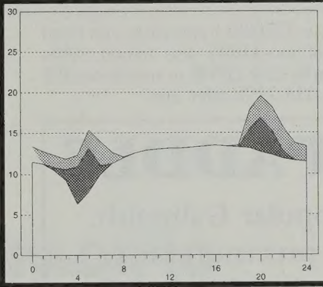
155°



WN-
Moscow
(LP)

23476 km

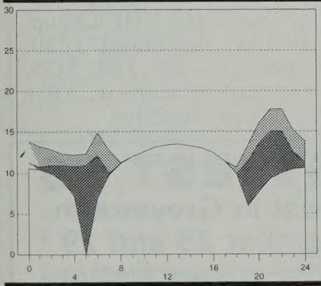
132°



WN-
Istanbul
(LP)

22856 km

101°



WN-
London
(LP)

21210 km

163°

░	MUF (50% success)
▒	OWF (90% success)
□	ALF

Horizontal axis shows time in UTC.

Vertical axis shows frequency.

Propagation is possible in the shaded areas, with best operation in the darker area.

These predictions are based on solar activity data supplied by IPS Radio and Space Services.

See p. 4 *Break-In* April 1994 "Choosing the Best Frequency" by John Gabites ZL2AQ for interpretation of forecasts and explanation of terms MUF, OWF and ALF.

HAMADS

FOR SALE—Yaesu FT1000 includes SP-5 speaker and phone-patch, MD-1 desk mike, purpose built custom desk—$7500. Yaesu FL7000 all band 1200 W input solid-state linear—$4000. Yaesu G-1OOOSDX antenna rotator and thrust bearing—$750. Yaesu FT530 VHF/UHF transceiver including MH-29 microphone, NC-42 fast charger, three batteries and case—$1750. Pac-Com TNC-320 HF/VHF Packet modem—$250. Cushcraft R7 all-band trapped vertical antenna—$600. AOR3000 scanner radio with D707 active antenna—$1500. All equipment is in new condition, further details call ZL3HD David (03) 385-5122.

FOR SALE—Ex-estate Kenwood TS-930S all-band HF transceiver. Condition as new, had very little use—$1500. Contact Secretary Branch 63. Telephone (04) 528-7705 or *Call Book* address.

FOR SALE—Yaesu FT-747GX in excellent condition, Yaesu YH55 headphones, brass key, Kaise voltohm milliammeter SK142, Emtron antenna tuner—Ron ZL3MY. Telephone (03) 755-6741 or *Call Book* address.

FOR SALE—Drake TX4C transmitter and R4C receiver combination with AC4 power supply, MS7 speaker, 7072 microphone, optional RTTY and CW filters, spare valves—$600. Kenwood PS30 13.8 V 20 A power supply—$295. VFO180 remote VFO—$150. AT180 SWR meter and antenna switching antenna tuner—$285—ZL2APY. Telephone (06) 326-8430 Palmerston North.

FOR SALE—12 V 20 A regulated power supply—$200 ono—Dusty ZL2VS. Telephone (06) 327-6225.

FOR SALE—One brand new EIMAC 3CX1200D7 Ceramic Amplifier Tube, fits the Henry Classic, 3K Premier, 3KD Premier, 3K Ultra, some Ameritron models and many others. Cost $956 New Zealand-landed, will sell or exchange—ZL3NZ. Fax (03) 312-7783, Telephone (03) 312-7787 or write to 22 Allin Drive, Waikuku Beach, 8254 North Canterbury.

FOR SALE—Estate ZL3KX Kenwood TS-820S in top condition with manuals, desk mike, spare finals etc.—offers to ZL3PD QTHR or Telephone (03) 308-3311.

FOR SALE—Icom 701 HF transceiver (new finals), IC701 power supply, SM2 desk mike and manuals—$850—ZL2AE. Telephone (07) 758-9832.

FOR SALE—Yaesu 757GXII transceiver with hand mic in mint condition—$1800 plus freight. Whangarei Amateur Radio Club QTHR or telephone (09) 436-3334 or (09) 434-7292 after 6pm.

CW PADDLE

The popular Galbraith GK-11 precision keyer paddle, suitable for all electronic keyers, is again available—$29.50 which includes packing & postage.

Christchurch Amateur Radio Club
PO Box 1733, Christchurch

FOR SALE—WELZ SP200 Power/SWR meter—$50. MFJ945C Versa Tuner II—$100—ZL2JG. Telephone (04) 293-6881.

FOR SALE—Kenwood TS-680S plus power supply—$1200. Yaesu FT-707—$500. Pakratt PK232MBX—$500. Icom IC-02A with two batteries—$450. Telephone (03) 454-4422 or Fax (03) 454-4022.

FOR SALE—Cushcraft R7 Multiband HF Vertical, cost $1000 sell $300 with assembly data. Matched pair 6164Bs, new GECs—$45—ZL4IN. Telephone (03) 208-5789 or *Call Book* address.

FOR SALE—Yaesu FT-51-R dual band handheld. Brand new still in the box. Current price over $1600, will take $1200. ZL3ACX. Telephone (03) 355-8570 or *Call Book* address.

FOR SALE—Kenwood TS-440S, complete with: ATU, YK88 CW and SSB filters, hand mic, mint condition—$2,100. Kenwood mobile TR-7850 2 m FM with 15 memories, and DTMF—$410. TONO MR-1300E 2 m all-mode linear amplifier—$290. Jim ZL1JFJ. Telephone (09) 407-6249.

WANTED—For SPAM activity valve-type communications receiver: Collins, RCA, Hammarlund, National, Eddystone, etc. Write to Boyd ZL2AE or telephone (06) 758-9832.

WANTED—Receivers type Hallicrafters SX115, SX117, Eddystone EA12, 880, 958, Heath SB300, SB301, SB303, SB313, Heath Scope SB610, Panadaptor SB620—Lloyd ZL1LA. Telephone (09) 480-5652.

WANTED—Pair of new or good used 6KD6 tubes for FTDX401—ZL2HY. Telephone (06) 862-8877 or *Call Book* address.

WANTED—Sockets with chimney for forced air cooled tetrode 4CX250. Two or more wanted—ZL1BRF. Telephone (09) 275-1340, *Call Book* address or PO Box 43024 Auckland.

WANTED—Pair of valves, 100TH, 75TH, 35T, or HK54—Bill ZL2DJ. Telephone (06) 751-1774 or write 21 Grenville Street, New Plymouth.

WANTED—Valves 4-125A or QB 3-300—ZL2DJ. Telephone (06) 751-1774 or *Call Book* address.

WANTED—AVO Valve Tester Type 160 or AVO Valve Characteristic Meter Mk IV, will consider other types—ZL2DJ. Telephone (06) 751-1774 or *Call Book* address.

Hamilton Amateur Radio Club

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Saturday
September 14 1996
Claudelands
Show Grounds

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Buyers from 10.00am

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or $15.00 per metre paid on the day

All Inquiries to: Market Day
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PO Box 606, Hamilton

ALL ADVERTS SHOULD BE PRINTED OR TYPED DOUBLED SPACED.

MEMBERS: 25 cents per word (min. $3.00).

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Members must submit proof of membership.

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CLOSING DATE: 10th of month preceding publication.

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Wellington Branch 50

Auction

Sat, August 3, 1996
Wellington College

Access by Government House
at the Basin Reserve

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Auction starts 10 am
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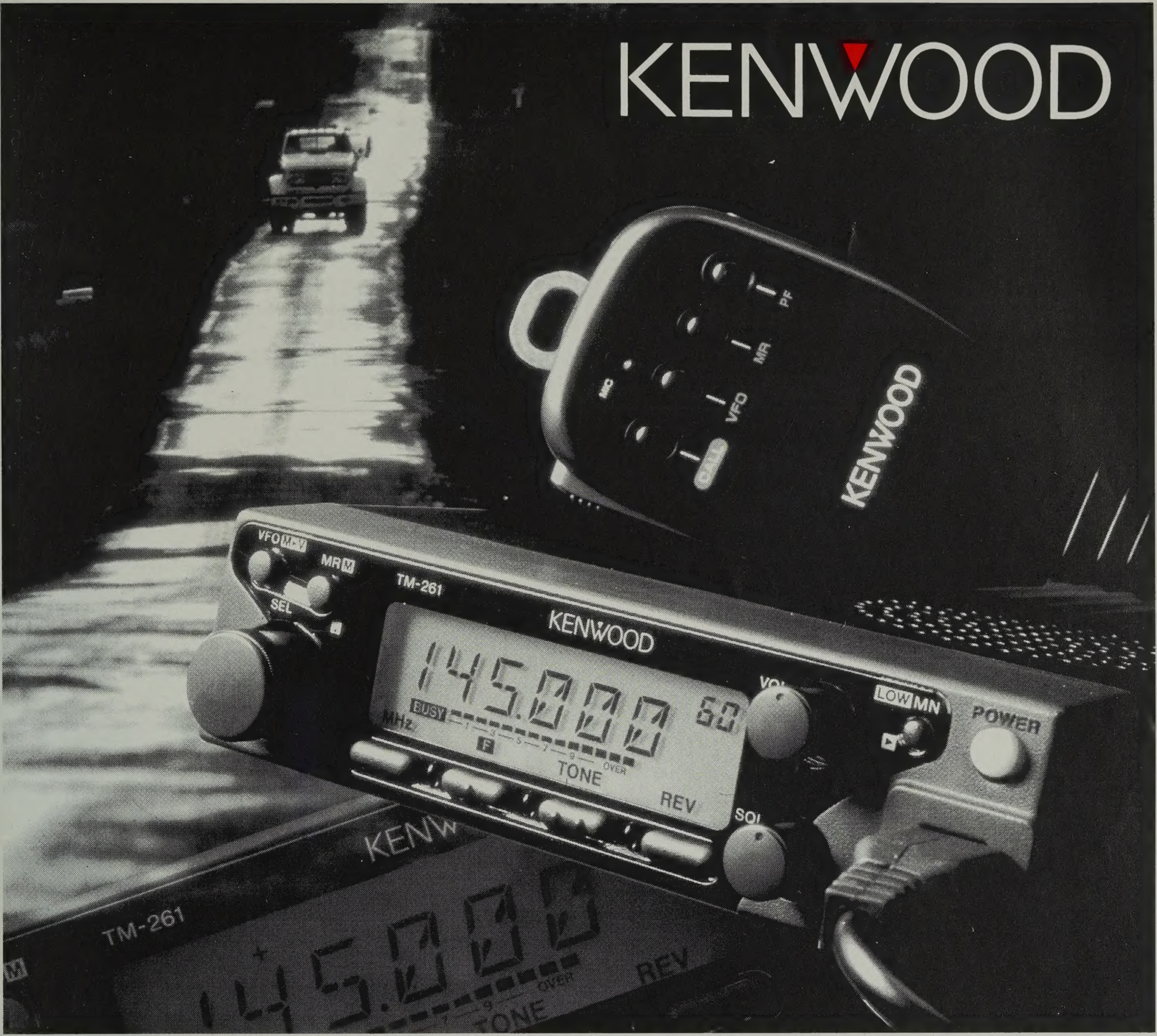
BAYCOM: BayCom Products are available from the Auckland VHF Group, PO Box 10-138, Auckland 1030. Modem kit, software—$95, FBU $135. Full price list sent on request. After sales support available.

WESTFEST 96

Hamfest in Greymouth
September 28 and 29
Full details in August *Break-In*



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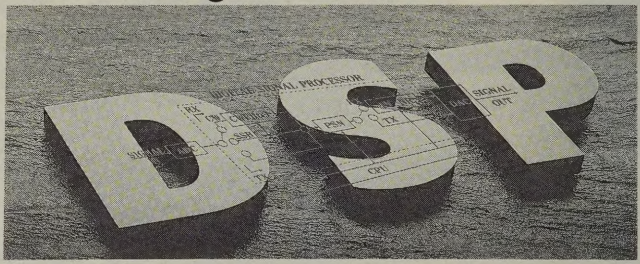

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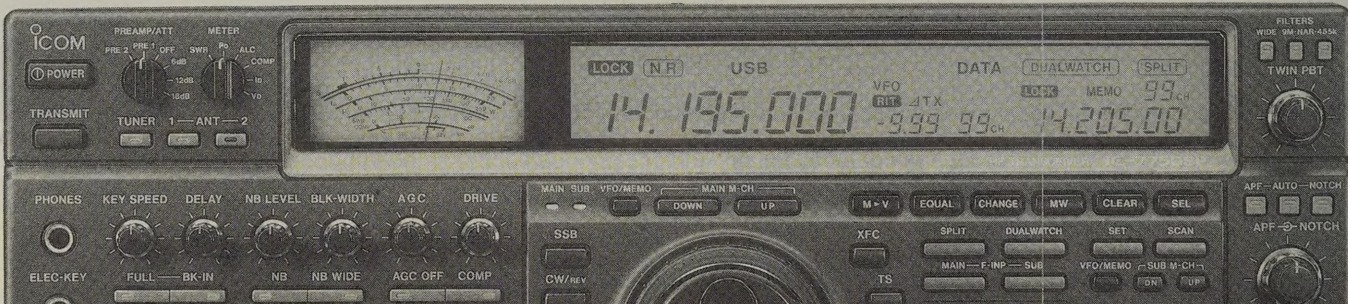
Excellent SSB transmit signals, that analogue methods can't compete with, are produced through control of signals at the modulation stage; noise reduction at the demodulation stage results in crystal clear signals—revolutionary DSP technology at work for the serious DXer.



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